ICE and REFRIGERATION

THE NATI
INDUSTRIA

New Lift-Slab Method Used For Cold Storage Plant . . . page 11

NOVEMBER • 1952

Warehousing For Frozen Foods Materials Handling . . . page 39

Even at minus 100° F.

NO WAX PROBLEMS

. . . when operators lubricate compressors with TEXACO CAPELLA OIL (Waxfree)

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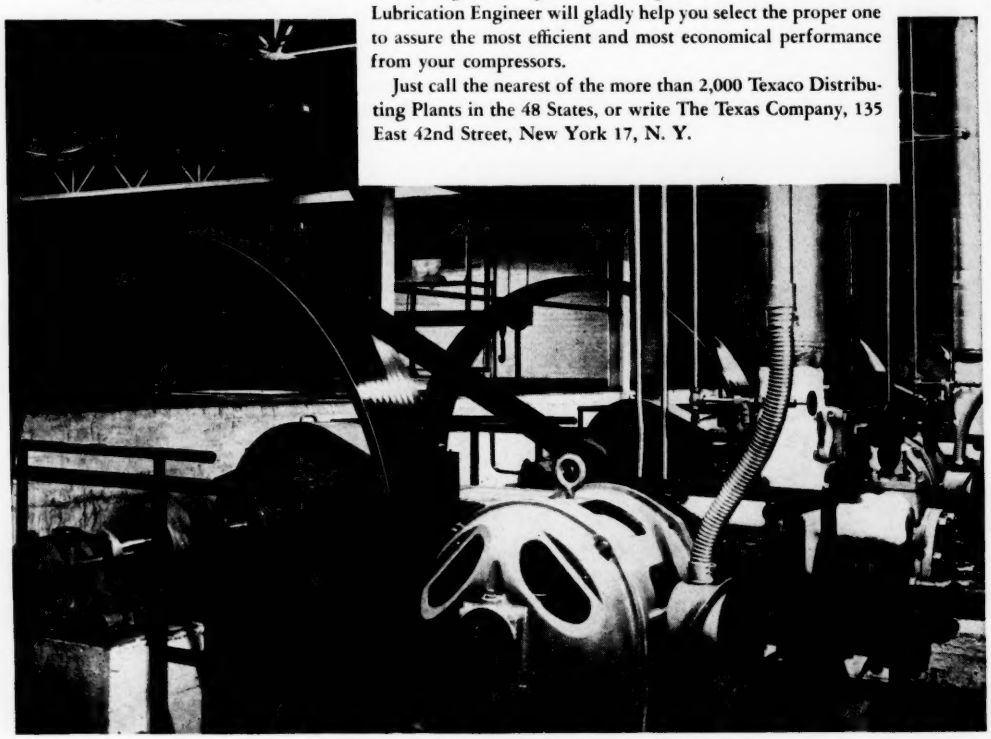

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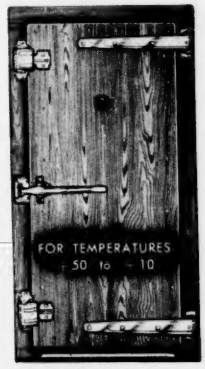
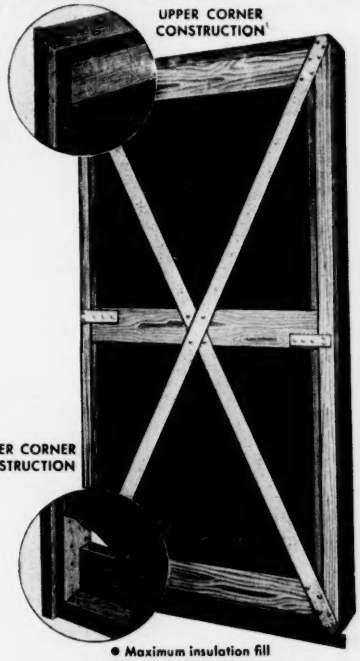
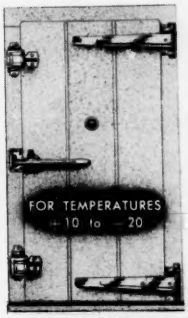
- 100% "Douglas Fir"
- Sanitary hardware



X-52 PLYWOOD PANEL DOOR
- Plywood front and back
- Extra heavy-duty hardware
- Special type gaskets

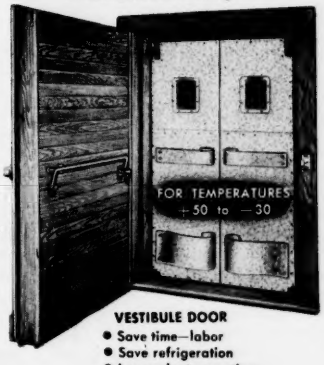


- Maximum insulation fill
- Most possible rigidity
- Allows reversal of swing



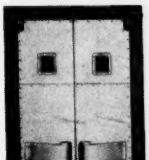
LOW TEMPERATURE DOOR
- Entire metal-clad front
- Extra heavy-duty hardware
- Special type gaskets

SUPER FREEZER (OVER-LAP) DOOR
- Extra-heavy construction
- Extra-heavy duty gaskets
- Extra heavy-duty hardware

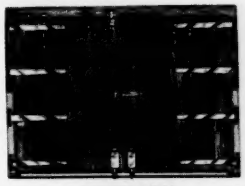


VESTIBULE DOOR
- Save time—labor
- Save refrigeration
- Large plant operation

TRACK DOOR
- For abattoirs
- Meat handling rails
- Banana rooms



AUTO-CLOSE DOOR
- For loading dock
- Intra-cooler doors
- Heavy trucking



DOUBLE DOOR
- For palletizing
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- For elevator shafts

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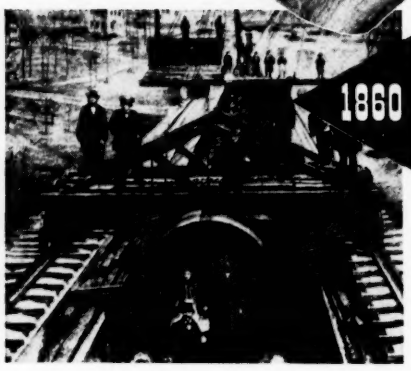

The Croton Aqueduct pipe line laying in 1860. This line, designed to carry water to the island of Manhattan, is made of ½-inch genuine wrought iron plate.

The Croton Aqueduct after more than 90 years of flawless service. A recent inspection of the line revealed that it was in excellent condition.

makes INSTALLATIONS LAST

Remarkable genuine wrought iron performance records similar to the Croton Aqueduct installation are recorded for a wide variety of services in practically every industry. The secret behind this material's ability to extend its "life-span" in corrosive services is illustrated in the notch-fracture test specimen pictured above.

This notch-fracture shows the unique fibrous structure of genuine wrought iron. Tiny threads of glass-like silicate slag, 200,000 to 250,000 per square inch of section, are distributed through the body of high-purity iron. These slag fibers are unaffected by corrosion, and set up mechanical barriers that halt and disperse corrosive attack, discourage pitting and rapid penetration. The fibers also anchor the initial protective scale, which shields the underlying metal.

Genuine wrought iron's service records from the past are providing an increasing number of the nation's leading engineers and designers with a reliable guide for material selection today. We will welcome the opportunity to review your corrosion problems with you —and to recommend the places where genuine wrought iron—on the basis of past experience—can be used to help cut maintenance costs.

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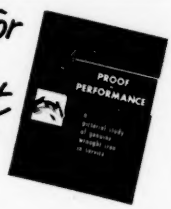

Interesting case studies of genuine wrought iron installations from the past are presented pictorially in this new, non-technical booklet, "Proof by Performance." There's a copy waiting for you.

BYERS

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WROUGHT IRON

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ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

ICE and Refrigeration

VOLUME 123 NUMBER 5

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November, 1952

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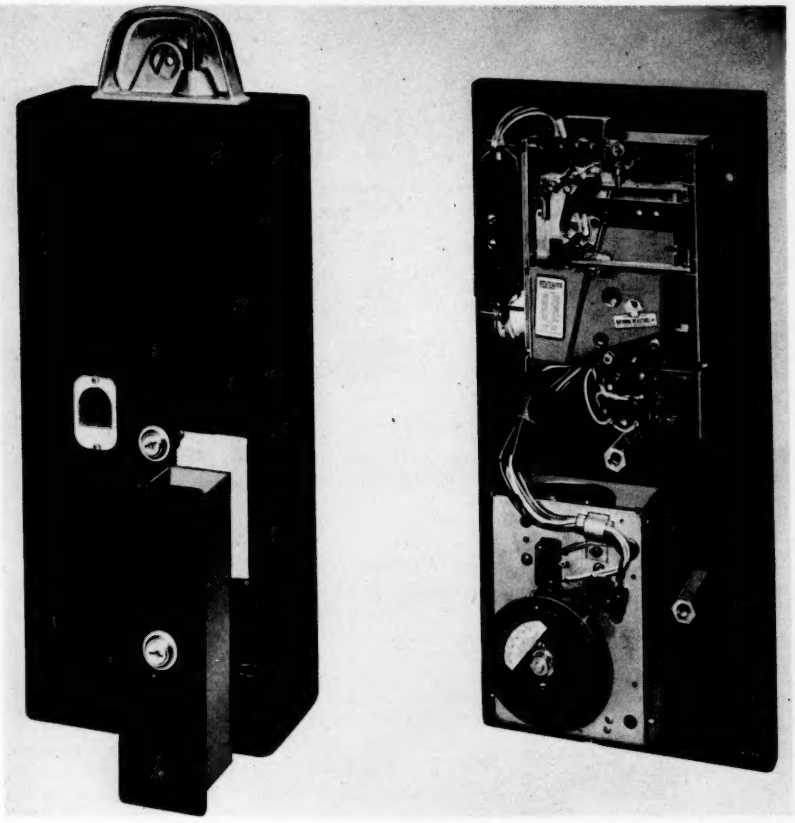
COIN ACCUMULATION

BY

NATIONAL REJECTORS, INC.



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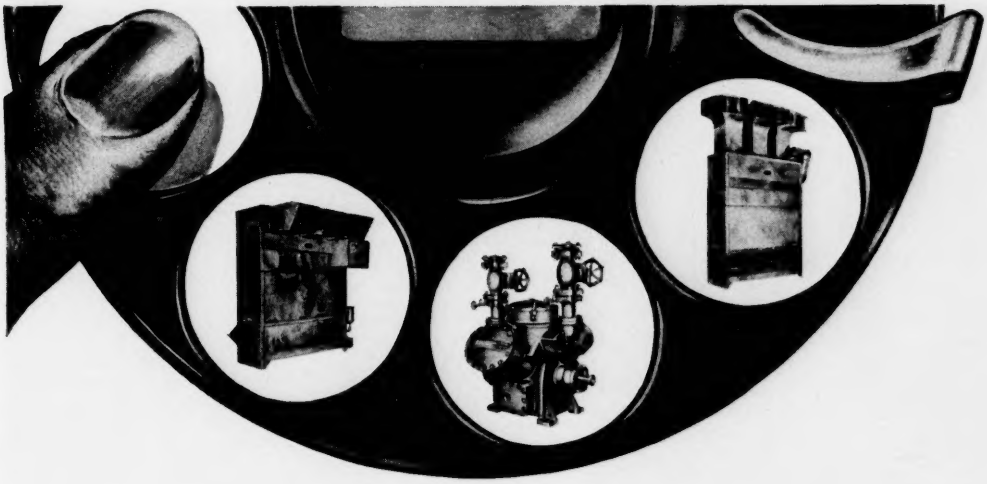

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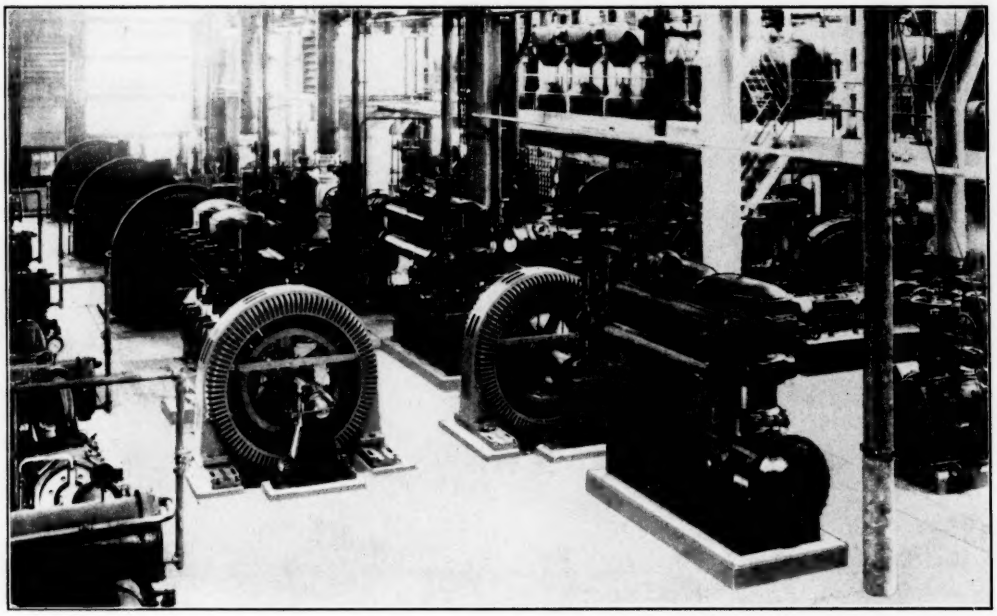


Celanese Corp. Uses 6420 Horsepower of Frick Refrigeration

Fourteen Frick refrigerating machines are in operation at the Amcelle plant of Celanese Corporation of America, near Cumberland, Md., makers of chemical yarns. Most of these ammonia compressors have been in use since 1929. The motors driving the new vertical machines, shown in the foreground, are each of 1250 horsepower.

This is a large-scale example of the dependability and economy of Frick ammonia refrigeration. Power requirements, when operating in summer weather on air conditioning loads, are only 0.70hp. per ton of refrigeration.

The really important jobs, whether for air conditioning, ice making, or other commercial cooling work, call for FRICK refrigeration.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

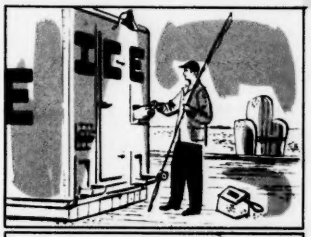
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

TAKE A TIP FROM A MAN WHO'S MADE IT PAY

George W. Heath
Manager, Ice Division
Oscar Mayer & Company
Madison, Wisconsin

George W. Heath tells you how Oscar Mayer & Company buys its Ice Bags: "First and foremost, we want maximum wet-strength protection. Effective closures are important. Wire for the large bags, tin ties for the smaller ones. We require good printing, top service and competitive pricing. We have purchased all of our Ice Bags from Union for as long as we have sold ice in paper bags."



FAMILIES who have access to automatic vending machines buy processed ice early in the morning, late at night, right around the clock.

VENDING machines are an answer to increased labor and delivery costs. People can get ice in convenient, clean wet strength paper bags where they want it, when they want it, and as they want it.

OPERATORS have found that buyers will stop at vending machines and pick up ice where they would not bother to call and wait for it to be delivered. Units which are properly located and maintained have advertising value that creates immediate impulse sales.

IN ADDITION to block ice, vending machines create heavy traffic for small bags of ice cubes and crushed ice. Proper bags are important. Good-looking, dependable wet-strength Union bags are one of the best merchandising aids you can have.

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for dependably dry, pure, uniform

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99.99% AMMONIA

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In the Spotlight

THE FIRST refrigerated warehouse to be constructed by the Youtz-Slick Lift-Slab method has been completed for the Merchants Ice & Cold Storage Company, San Antonio, Tex. Construction details are illustrated and described in the article on page 11.

STUDIES conducted in Pacific Northwest apple packing and storage warehouses show that receiving costs can be greatly reduced by using more modern materials handling equipment. See article starting on page 13.

THE ANNUAL ice convention to be held in Cincinnati November 11-14 will be pointed toward how to make more ice profits and outside speakers will give a view of the overall economic picture. Fnal preview is given in the article on page 17.

THE CONTROL of hazards in ice plants can only be accomplished by proper preparation and constant training. This subject is discussed by a safety engineer in the article on page 21.

THE ANNUAL NAPRE Convention to be held at Dallas, Texas November 12-14 will offer a gala entertainment and social program to fill in the time between business sessions. Full details are given in the article on page 27.

A PANEL DISCUSSION on reducing costs and time lost in moving shipments of poultry by warehousemen and poultry packers was a feature of the annual convention of the National Poultry Butter & Egg Association. For summary of the discussion, see page 35.

FROZEN orange juice concentrate sales were up 117 percent in May over the same month last year, according to the Florida Citrus Commission.

COVER: Engine room in new Omaha plant of United States Cold Storage Corporation formally opened in September. There are three rotary booster compressors, four multi-cylinder compressors, with inter-coolers, condensers and other auxiliary equipment. Story on page 37.

FROZEN FOOD wholesalers must do a good job of handling materials because their service consists mostly in moving packages into and out of storage. This important subject is discussed and analyzed in a study issued by the Production and Marketing Administration of the U. S. Dept. of Agriculture. See page 39.

NEW COLD STORAGE warehouse is opened at Omaha, Neb. by the U. S. Cold Storage Corporation of one story construction, with latest methods and equipment, with total space of 148,000 square feet and 76,500 square feet of freezer space. For story on formal opening and illustrated description of the plant see page 37.

LETTERS

Ice For Poultry

THANK YOU kindly for your letter of the 15th and a copy of your September issue of "Ice and Refrigeration." Ice is definitely a part of our promotion in the sale of commercial chickens, turkeys and fowl for the advantages that ice possesses in keeping the product in a good healthy sales condition. We have asked our representatives over the country to work with their local ice companies in local promotions. It would be well for the ice manufacturers to contact our men in tieing in to our mutual benefit.

G. F. SNYDER
Merchandising Mgr.,
Poultry Div.,
Armour & Company

60 Years Ago

From the November, 1892 issue of ICE AND REFRIGERATION

A NEW APPLICATION of refrigeration is under advisement by managers of the beet sugar factory at Norfolk, Neb., who believe that the adoption of the cold storage system would enable the factory to store beets in sufficient quantity to operate continuously, especially from September 15 to May 1, a season when there are no beets received from the growers.

ENGLAND as a nation has hardly discovered as yet the great value of ice as an antiseptic outside the hotels, restaurants, butcher shops and cold stores of the great cities. Even in London and Liverpool, the household refrigerator is comparatively unknown for domestic or household purposes. The price is generally much higher than in America, showing the limited consumption and the fact that none is made by nature at home. In the cities of Germany as well as in the country, both ice and refrigerators are in more general use than in any other European country, although not to the extent seen in America.

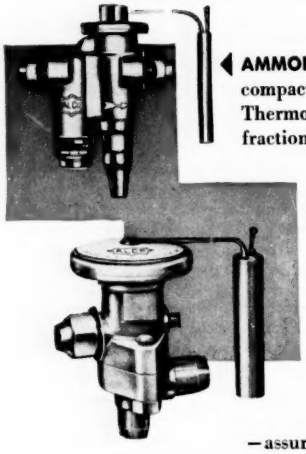
THE AMERICAN Warehousemen's Association held its second annual meeting at the Grand Pacific Hotel, Chicago, October 21. Some thirty members were present, representing as many leading storage houses of the country engaged in general storage and in a few instances cold storage interests. The aim and object of this association is the elevation and conservation of the storage business and the discussion of the general and legal principles involved in the business and also the elevation of the character and value of warehouse receipts as "collateral" property.

INQUIRY for information on the proper degree of temperature at which to keep various kinds of perishable goods in cold storage brought the answer there was no literature on the subject, American or foreign. To meet this need ICE AND REFRIGERATION compiled and published what is apparently the first list of products usually kept in cold storage, with the generally accepted temperatures or range of temperatures at which or within which it was considered safe to keep such products. Aware that there was a wide difference of opinion among cold storage managers as to the best temperatures, the figures were submitted more in a tentative manner than as positive authority on the subject.

symbol of a job well done

There's an ALCO control for every application—large or small.

Installation of an ALCO VALVE assures steady, accurate refrigerant control...maximum coil efficiency... trouble-free refrigeration.



AMMONIA THERMO VALVES—have the same compact, come-apart design as all other Alco Thermo Valves. Large area strainers. From fractional tonnage to 125 tons.

"T" SERIES — for automatic liquid refrigerant control on all types of refrigeration and air conditioning systems. From fractional tonnage to 50 tons "Freon-12".

J-5 FLOAT SWITCH
—for liquid level control. Simple design. Application: Freon, Methyl Chloride or Ammonia.

MULTI-OUTLET VALVES
—assures maximum coil efficiency on multiple systems. For all refrigerants and applications: ½ to 50 tons "Freon-12"; up to 50 tons Ammonia.

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5218

New Lift-Slab Method Reduces Costs of Concrete Building Construction

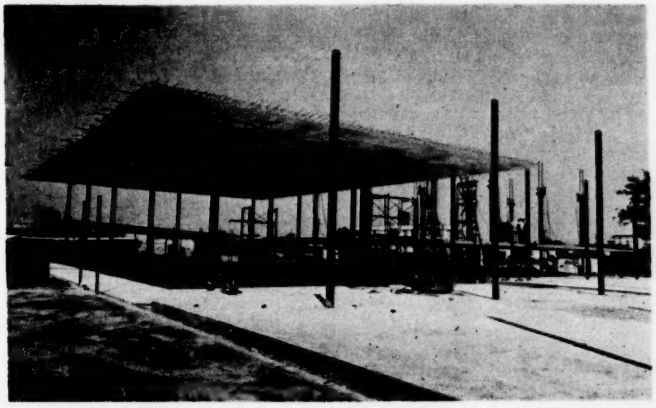
A NEW method of building construction that is specially adapted to one-story construction is meeting with much favor where economical building costs are desirable, as in new one-story refrigerated warehouses. This is known as the Youtz-Slick Lift-Slab method, conceived by Philip Youtz, New York architect and Tom Slick, Texas oil-man-rancher-scientist, and perfected in the laboratories of the Institute for Inventive Research and the Southwest Research Institute, near San Antonio.

Floor slab and columns in place during construction of Merchants Ice & Cold Storage plant at Houston, Tex. In the foreground is the dock beams and fill about ready for the pouring of the dock slab. In the right foreground the steel has been set to pour the first quarter of the roof slab.

New Method

The new method is called the Youtz-Slick Lift-Slab Building Method, combining the names of the two inventors. It provides a technique that is unique in the construction field. The method can be basically described as follows: The foundations for a building are poured in place followed by pouring the base or floor slab. The columns are then placed, anchored, and grouted. Pipe, structural steel, or concrete columns can be used. The second floor slab or roof steel slab, if the building is of one story only, in then laid out on the base slab, using this base slab as the bottom form, with only edging forms necessary.

The concrete is then poured directly on the base slab and allowed to set and cure for at least seven days. Hydraulic lifting equipment is placed on the columns and is attached to the slab and the slab is raised to its permanent position on the columns where it is welded, or otherwise fastened, to the column by means of a collar which has been placed in the slab around each column at time of pouring. The building is then completed by adding non-weight-supporting curtain walls and partitions. The final result is an entirely smooth ceiling with no projecting beams or joists.



This picture, taken from the opposite side of the building from the first view, shows the first slab lifted in place and the second slab at right rear being lifted by the machine and men thereon. The two remaining roof slabs are resting on the floor slab as shown in the foreground.

Primary Advantages

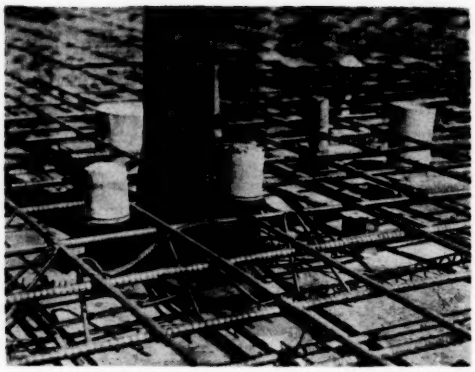
Primary advantage of the method is that of economy, due to the elimination of concrete forms and other costly construction methods and an excess of materials. Economy to the owner is assured by a planned system of construction which permits the contractor to do better work in less time at lower cost. To the builder it means high grade construction at low cost because of five principal savings:

1. Pouring and fabrication of all floors and roofs at ground level.
2. Elimination of forms, centering, scaffolding, and hoists.
3. Work carried forward efficiently on completed floors.
4. Protection of workers from the elements and from danger of falling tools and the like, as soon as the floors are raised into position.
5. Speed which is all-important in economical building.

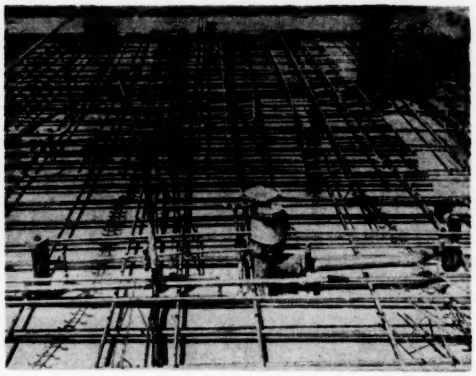
San Antonio Warehouse Uses Youtz-Slick Method

A construction job of direct interest to the refrigerated warehousing industry, for which this method of construction was used, was that of a single-story warehouse erected for the Merchants Ice & Cold Storage Company, Inc., San Antonio, Texas, with approximately 300,000 cubic feet of freezer space.

This new building is a single story structure of concrete, steel and hol-



Column collar detail, used in Youtz-Slick Lift-Slab method.



Plumbing and electrical detail prior to pouring lift slab.

low tile, with light aggregate concrete and steel for roof slab. The ceiling is perfectly smooth, allowing a free flow of light and air, and is 16 ft. high supported with 6½ inch pipe columns on 21 ft. centers. These columns are filled with concrete. The roof slab was poured on top of floor slab and after fourteen days cure was lifted into position by the Youtz-Slick hydraulic lift.

Truck Loading Dock

The truck loading dock is 12 ft. wide and 138 ft. long, allowing for simultaneous loading of 10 trucks. A steel deck canopy above has an overhang of 3 ft. in order that trucks may discharge or receive loads in rainy weather. There is also a 12 ft. wide unloading dock along side a four-car rail siding which also has a canopy overhead.

Cork board insulation has been laid over the roof slab and down the walls through a slot which was left between the roof slab and walls, and this corkboard joins the corkboard under the floor slab making a complete box without a break in the insulation.

Pipe Columns

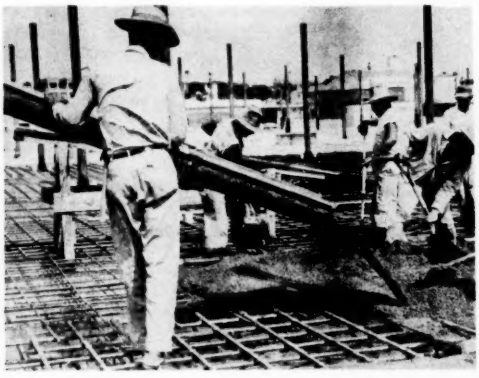
The pipe columns were utilized to hang 59,500 ft. of 1¼ inch and 1½ inch ammonia pipe coils across the ceiling. This amount of pipe surface will allow for a very low differential between the temperature of the refrigerant and the room temperature which is the ideal sought after in the operation of freezer space. Six large high speed blowers will be hung at strategic locations near the ceiling for a fast movement of air, but will only operate when the need arises.

All handling will be done with mechanized equipment such as fork lift trucks, pallets, transporters, etc., and a 20 percent saving in labor cost is expected. Speedup in operation will cut in half the time required to handle merchandise to and from trucks and rail cars. Loading docks are off the street and all traffic problems will be eliminated. A large parking space on the property, enclosed with cyclone protective fencing is available for out of town trucks arriving after closing hours, and drivers may leave their trucks here with complete safety until opening hours the following day. Electric plug-in circuits for refrigerated trucks will also be available.

Labor Survey

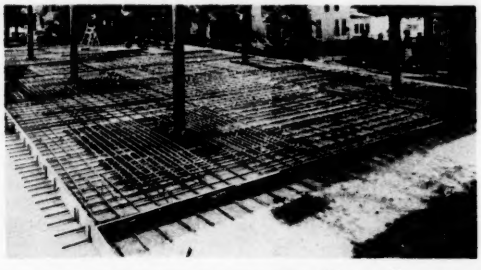
THE NORTH Atlantic Chapter has taken a forward step, and a most helpful one, by inaugurating a "refrigerated warehouse labor questionnaire." It asks its members pertinent questions involving rates paid for various classifications; guaranteed hours; overtime; holidays; vacations; welfare provisions and union contracts.

With present-day difficulties in the labor field and the increasing demands being made on industry by conscienceless individuals among strong and gigantic labor groups, the exchange of this type of information, it is believed, will be most helpful.



Left: Pouring concrete for building with Youtz-Slick Lift-Slab method.

Below: Steel details of lift slab, Youtz-Slick Lift-Slab method.



REDUCED HANDLING COSTS

Results of materials handling research in Pacific Northwest apple packing and storage houses show decreased costs and resulting economy in use of modern handling equipment

Fig. 1—Motor truck end of a receiving operation using belt conveyors in combination with clamp-type two-wheel hand trucks.

Fig. 2—Worker inside the storage room removing field boxes of fruit from the belt conveyor and placing them in 6-high stacks.

MATERIALS-HANDLING research under way in Pacific Northwest apple packing and storage houses reveals wide variation in the costs incurred in receiving apples at these houses by different methods and types of equipment currently used. These studies show that it would be possible for some storage houses to reduce their receiving costs nearly 80 per cent by adopting the more efficient methods and types of materials-handling equipment, provided existing facilities are suitable or do not require major alteration.

A survey of 252 Washington State apple packing and storage houses made during the 1950-51 season shows that, basically, six different methods and types or combination of types of materials-handling equipment are used for performing receiving operations: (1) Clamp-type two-wheel hand trucks and powered belt conveyors, (2) clamp-type two-wheel hand trucks alone, (3) clamp-type two-wheel hand trucks and floor chain conveyors, (4) clamp-type two-wheel hand trucks and industrial clamp trucks, (5) industrial fork-lift trucks and pallets, and (6) clamp-type two-wheel hand trucks and elevators. Roughly 83 per cent of the houses surveyed used methods (1) and (2) for performing receiving operations. Studies of the first five methods were made during the 1950-51 season.

Materials handling studies in the Pacific Northwest apple packing and storage warehouses show that it would be possible for some houses to reduce their receiving costs nearly 80 percent by adopting more efficient methods and types of handling materials handling equipment. The fork-lift truck, in particular, is especially efficient from this standpoint.

In analyzing the comparative efficiency of the five methods and types or combinations of types of equipment it was found that man-hours of labor for receiving identical volumes of fruit in field boxes amounted to 10 per cent of the labor required when the older and more predominant methods and types of equipment were used. The use of the industrial clamp truck in combination with the clamp-type two-wheel hand truck requires about 40 per cent of the man-hours of labor required when the hand truck is used alone to attain equivalent production.

Equipment ownership and operation costs are relatively low for the two-wheel hand trucks, amounting to only a few cents per 1,000 boxes. However, for methods incorporating the use of industrial clamp trucks and fork-lift trucks these costs are relatively higher, ranging from $1.10 to $1.99 per 1,000 boxes, the variation depending upon the size of the unit loads. For the belt conveyor used with the clamp-type two-wheel hand trucks, and floor conveyor used with the clamp-type two-wheel hand trucks, equipment costs per 1,000 boxes fall within the cost range shown.

The combined labor and equipment costs for receiving palletized field boxes of apples with fork-lift trucks is only 20 per cent, approximately, of

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This is a summary of a report issued by the Production and Marketing Administration of the United States Department of Agriculture. It was prepared by Joseph F. Herrick, Jr., Agricultural Economist, Marketing and Facilities Research Branch Production and Marketing Administration, United States Department of Agriculture, and D. Loyd Hunter and Raoul S. Duerden, industrial engineers, Research Department, Washington State Apple Commission. The research on which it is based is part of a larger study covering the physical handling of various types of packages of perishables produce in facilities at various stages of the marketing system.

Fig. 3—Six-box stack of apples being deposited at the storage point with a clamp-type two-wheel hand truck.

Fig. 4—High stacking of field boxes of apples by hand at the storage point.

the costs for receiving the same volumes with the belt conveyor and two-wheel hand truck. The relative efficiency of the fork-lift truck is not so great when compared with the method in which the two-wheel hand truck is used alone, or with the method in which the floor chain conveyor is used in combination with two-wheel hand trucks. However, considerable savings would be possible in most plants using the latter methods if they adopted the fork-lift truck.

Receiving Costs

The costs for receiving 1,000 field boxes of apples with each of the five methods and types of equipment previously described are: (1) Belt conveyors and clamp-type two-wheel hand trucks, $9.58; (2) clamp-type two-wheel hand trucks alone, $6.75; (3) floor chain conveyor and clamp-type two-wheel hand trucks, $7.49; (4) industrial clamp-type trucks and clamp-type two wheel hand trucks, $5.17 where 24 boxes are transported per load and $3.58 with 36 boxes per load; and (5) pallets and industrial fork-lift trucks, $2.18 where 36 boxes make up a pallet load, and $1.93 with 48 boxes per pallet.

These costs are computed using assumed wage rates of $1.25 per hour for common labor and $1.50 per hour for semi-skilled labor (industrial truck operators). Per hour equipment costs used in these computations include both the costs of ownership and operation. Ownership costs are based on typical annual hours of use per item of equipment in apple packing and storage houses. The combined costs per hour for the types of equipment used are: (1) Belt conveyor, $0.71; (2) clamp-type two-wheel hand truck, $0.05; (3) floor chain conveyor, $0.95; (4) industrial clamp-type truck (2,000-pound capacity), $1.80; (5) industrial fork-lift truck (2,000-pound capacity,) $1.53; and

TABLE SHOWS COMPARATIVE LABOR COSTS FOR RECEIVING FIELD BOXES OF APPLES AT STORAGE HOUSES AND ELAPSED TIME REQUIRED FOR UNLOADING MOTOR TRUCKS BY USE OF SPECIFIED METHODS AND TYPES OF EQUIPMENT (PRELIMINARY, SUBJECT TO REVISION)

Method and equipment	Time studies made	Workers used in crew	Labor required to receive 1,000 field boxes of apples: Unload motortruck and transport to storage 1/	Place in storage	Allowance 2/	Total	Labor cost per 1,000 boxes 3/	Elapsed time to unload motortruck 4/
	No.	No.	Man-hours	Man-hours	Man-hours	Man-hours	Dol.	Hours
Belt conveyor and clamp-type two-wheel hand truck	32	5	3.52	5/ 2.55	0.86	6.93	8.66	0.47
Clamp-type two-wheel hand truck (alone)	15	4	2.11	5/ 2.55	.70	5.36	6.70	.45
Floor chain conveyor and clamp-type two-wheel hand truck	16	4	1.83	5/ 2.55	.67	5.05	6.31	.38
Industrial clamp truck 6/ and clamp-type two-wheel hand truck:								
24 boxes per load	5	3	7/ 1.77	8/ .39	.17	2.33	3.18	7/ .31
36 boxes per load	10	3	7/ 1.57	.11	.17	1.85	2.46	7/ .26
Pallets and fork-lift truck 6/								
36 boxes per pallet	17	1	.59	.13	.09	.72	1.08	9/ .29
48 boxes per pallet	23	1	.46	.09	.00	.55	.82	9/ .24

1/ Transportation distance was standardized at 100 feet.
2/ Allowance covers fatigue and crew interference for the entire operation.
3/ Based on an assumed wage rate of $1.25 per hour for all labor except the time of the operators of industrial clamp trucks and fork-lift trucks, for which a rate of $1.50 per hour was used.
4/ Times shown are for unloading a motortruck containing a load of 288 field boxes. Speed of receiving is not affected by manual high-piling operations.
5/ Includes time required for positioning fruit in storage by hand truck and manual high-piling of half the boxes.
6/ Gasoline powered.
7/ Fruit first moved from motortruck to platform with clamp-type two-wheel hand truck.
8/ High figure due to releasing load in congested area.
9/ Unloading pallets from motortruck to unloading apron.

Fig. 5—Moving six-high stacks of field boxes of apples off the motor truck with a clamp-type two-wheel hand truck transported by same worker to stacking point.

Fig. 6—A fork-lift truck removing a loaded pallet from a motortruck bed preparatory to transporting it to the storage area.

(6) industrial fork-lift truck (4,000-pound capacity), $2.01.

Where existing facilities are suitable and the annual volume handled is sufficient, storage house operators now using older methods and types of equipment could reduce their receiving costs by adopting the fork-lift truck. A plant that received 300,000 field boxes of fruit during the harvest season should, if no major alterations in the facility are necessary, save more than $2,000 per season on its receiving operations by converting from belt conveyors and clamp-type two-wheel hand trucks to a pallet and fork-lift operation with 48-box loads.

Operations Studies

Among the operations studied were those involved in receiving fruit in field boxes at the storage house. As used in this report, "receiving" covers the cycle of operations performed in: (1) Unloading field boxes of apples from the motortruck, (2) transporting the boxes from the motortruck to the storage point, and (3) stacking the boxes at the storage point.

Although the data used herein are preliminary, it is felt that they should be of value to the operators of apple packing and storage houses in improving their receiving operations. However, it should be pointed out that facility layouts and designs of some plants may preclude the change to a more efficient type of equipment or method unless major modifications are made.

Factors To Be Studied

Where existing facilities are suitable or can be remodeled at a reasonable cost, the industrial truck, both the fork-lift and the clamp-type, offers real possibilities for reducing the cost of receiving operations and the consequent demand for labor during the harvest season provided the individual plant's annual volume of receipts is sufficiently large to war-

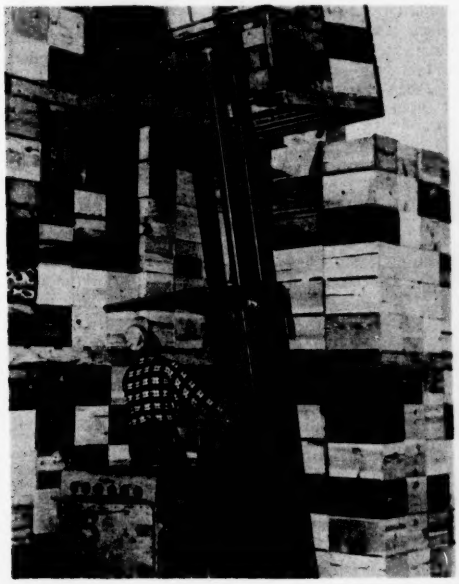


Fig. 7—(Left) Pallet loaded with 48 field boxes of apples being stacked at the storage point.

Fig. 8—(Below) Clamp-type industrial truck transporting 36 field boxes of apples to the storage point.

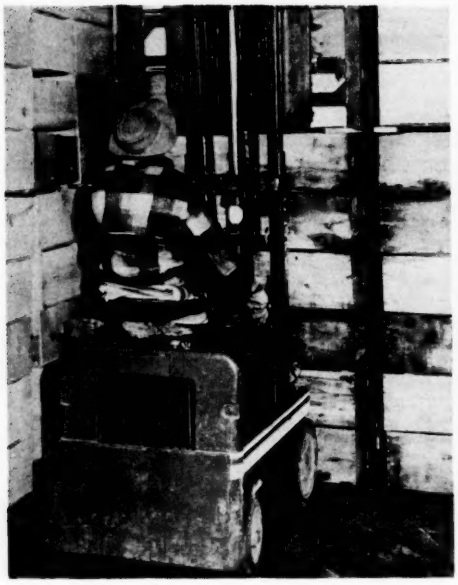
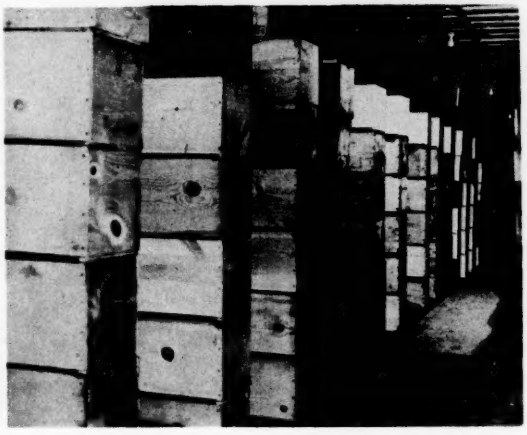


Fig. 9—(Left) Industrial clamp truck positioning a unit load of field boxes at the storage point.

Fig. 10—(Below) Floor chain conveyor moving six-high stacks of field boxes within the storage room.



rant the ownership of the equipment.

For any perishable product, such as apples, which is harvested over a period of from 4 to 6 weeks, methods of receiving which decrease the peak demand for labor are desirable. The industrial truck offers possibilities for reducing the competition for labor during the harvest season. Mechanized receiving should free some workers to assist with the harvest, which must be done promptly and speedily in order to preserve the storage and market qualities of the fruit. In addition, there are some indications that managerial problems in the plant are simplified with the use of industrial trucks, since large crews of workers would not be needed nor should it be necessary to employ standby help.

Handling apples with industrial trucks causes less damage to fruit than is caused by use of other types of equipment, since the fruit is handled fewer times. Another advantage is that motor trucks bringing fruit from the orchard are tied up for shorter periods than they otherwise would be, and therefore can make more trips between the orchard and the storage house each day.

Before adopting different methods and equipment from those now in use, however, management should compare the costs of ownership and operation of the new equipment with the old equipment to determine whether the volume of business would be adequate to return these costs during the expected life of the equipment. Next to be considered is whether the new method and equipment can be used efficiently in the currently owned facilities without major costly alteration. If it is decided that they cannot be so used, an analysis should then be made of all costs involved.

For example, a facility might have a satisfactory layout and proper ceiling heights and still not have a floor load capacity that would support heavy industrial-type trucks without major remodeling. Relatively low ceilings in storage rooms could also mean that the advantages of the fork-lift truck over the other types of equipment might be considerably reduced. However, the relatively wide aisles necessary for the efficient use of industrial trucks may reduce the net storage or piling space in a room or a plant. Door widths and heights must also be adequate to permit free movement of equipment, and platforms should be of proper height and have sufficient floor area.

Plant operators who are considering the adoption of different types of equipment from those now in use may obtain additional information from the Research Dept., Washington State Apple Commission, Yakima, Wash., or from the Marketing and Facilities Research Branch, Production and Marketing Administration, U. S. Dept. of Agriculture, Washington 25, D. C.

Fig. 11—Clamp-type two-wheel hand truck being used to deposit a six-high stack of field boxes of apples on the receiving end of the floor chain conveyor.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE NDUSTRIES

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THIS MONTH IN BRIEF

After a good ice season it is expected that droves of ice men, their employees and families will land in Cincinnati for the annual convention of the National Association of Ice Industries, where an excellent program of discussions and reports will be presented, and also a complete entertainment program — November 11 to 14.

A meeting of the Board of Directors of the National Ice Association uncovered a considerable number of thought provoking and profit making ideas which have been compiled and published.

Three hazards common to ice plants are lifting, slipping, and falling. Causes and remedies for each are analyzed and discussed.

The annual convention season for the ice industry was opened by the Florida Ice Association at the Hotel Floridan, Tampa, October 12-14. There was a good attendance and an interesting program.

A series of three billboards will be used by Indiana ice distributors to publicize extra ice for parties, picnics, and other uses.

LAST CALL For Ice Convention

Icemen heading for Cincinnati for annual convention November 11-14 will hear good program pointed toward how to make more ice profits

AFTER A good ice season it is expected that droves of ice men will be headed toward Cincinnati for the big Convention, November 11-14. The convention program is now in good shape, most of it pointed toward how to make more ice profits. Most of the ice men who attended this convention will be profit minded when they return home.

In an open forum for profit's sake, The Utopia Ice Company has been put together to show how the perfect ice company keeps the cash register ringing up sales. This Utopia Ice Company will have personnel including an expert on making vending machines pay off, a man who can put the meat-on-ice method of displaying fresh meat into most of your grocery stores, a fellow who knows all about combatting "on-premises" ice-making machines, a real go-getter to create new customers for party ice, a production engineer to cut overhead costs and a top management ice man. These men make up a panel of ice leaders ready to answer questions at the forum session on Wednesday. This promises to be the liveliest interchange of ideas ever planned for an ice convention.

Speakers

Speakers of National reputation will help orient the iceman's business position with relation to the overall economic picture.

Appropriately, the keynoter will be John M. Mock, management consultant of Evanston, Illinois. He plans a "tailor-made" talk to fit the specific needs, interests, problems and objectives of the Ice Industry. He comes highly recommended from other trade associations and business organizations. His background includes selling, business management, and personnel training.

"More Profits Through Merchandising," a talk by Morris Shlensky, vice president and general manager of the Katz Drug Co., Kansas City, Mo., promises to be one of the highlights of the meeting. This experienced speaker will have a message for all.

Clayton Rand, dynamic, inspiring and humorous has been engaged to address the convention. He speaks the language of those eager to stimulate the American Way of Thought. Coming immediately after the November election, his comments will be most

John W. Mock
Evanston, Ill.

Morris Shlensky
Kansas City, Mo.

Clayton Rand
Gulfport, Miss.

appropriate. Clayton Rand is a man with a message for everyone. He has just returned from a European tour, part of which took him behind "the iron curtain." His uncanny ability to present his views in such interesting and forceful words has made him one of the most wanted speakers in the country.

Staff Members Report

In a series of reports during the convention, staff members will tell how their activities produce profits. Research has made great strides this year. Members of the convention will hear about what has been done to create profitable new uses for ice. The legal counsel legislative watchdog for the iceman is constantly protecting the industry's interests and only through reliable information detected at the Washington scene can managers plan future administrative moves. In view of the political timeliness of the convention this vital message will be of special importance.

The Public Information and Marketing Department will report on the program for seeking out customers to various consumers and trade media all year long. Publicity puts ice customers in a frame of mind to buy ice. Accomplishments and next year's plan will make for interesting listening to all present.

The Executive Secretary's annual report will keep members in touch with the association's progress, plans and objectives. Comments this year will show how they can cash in on their NAII participation.

At the Thursday meeting an unusual approach to creating bigger markets for processed ice will be presented. It will consist of an analysis of processed ice sales potential and a means for making the most of the situation. This part of the program will be a MUST for all those at the convention.

Junior Members Invited

The idea of taking younger executives to the convention came up at a recent meeting of the Board of Directors. It is a good one. This is the best possible manner of giving junior executives of the organization a better perspective on ice selling and all other phases of the ice business. It is suggested that as a reward for meritorious service one or two junior executives from each company be taken to Cincinnati. It will be money will spent. Undoubtedly they will absorb new ideas and enthusiasm for the year's work ahead and most important, they should be given some leeway when they get back home to put into practice what they will have learned.

Entertainment

One of the regular features of all national ice conventions, the President's Dinner Dance, will come up to the usual high standard. The dinner will be on the exceptional side. The show is all lined up with novelty acts, singers, dancers, beautiful girls, one of the top Cincinnati dance orchestras, all of which guarantees fun for everyone.

The Netherland Plaza is a wonderful hotel where the atmosphere is cordial, surroundings are in excellent taste and the location is perfect. There will be other entertainment features and there will also be time off for delegates to seek their own entertainment.

Directors Uncover Profit Possibilities of The Ice Business—A Digest of Meeting

AT A MEETING of the Board of Directors, with members of the Association staff of the National Association of Ice Industries, held at Cincinnati July 29 and 30, a considerable number of thought provoking ideas were developed. This meeting was reported in the September ICE AND REFRIGERATION. Since then, a compilation of the findings have been issued in a Bulletin of the National Association.

Corn Icing . . . is paying off in a big way for those ice companies that have really gone after this tonnage. Development of this new field of potential tonnage has led to icing of other vegetables: celery, asparagus, carrots, lettuce, spinach, etc.—all for local distribution.

Work is under way by the Association on possible use of Ice in wet-strength paper bags for packing many other vegetables.

Meat on Ice . . . Developed through research in the University of California and reported in numerous Association bulletins . . . is catching hold rapidly throughout the industry.

THESE PROFIT POTENTIALS MEAN MORE MONEY

Corn Icing
Meat-on-Ice
Hydro Cooling Peaches
Automatic Prepared Ice
Channel Icing of Vegetables
Packaged Ice Bags
Year 'Round Service
Better Local Public Relations
Chests and Ice Cream Freezers
Vending Machines

Progressive ice companies the country over are cashing in on this new field for ice sales. One large company has designed and is using a metal pan in place of paper under the ice in the case. Customer makes his own purchase from tinner and makes his own installation. Pans have proved to be most successful. Meat icing eases way to introducing customers to vegetable icing display. A word of caution: *FOLLOW UP new installations.* Have service man work right along with ice salesmen. Advertise freely.

Research work under way on icing of lima beans and other vegetables for canning and freezing is encouraging and promises a new field for additional ice tonnage.

Ion Exchange . . . First year of two-year research study of Ion Exchange water treatment in University of Texas has been completed with results good. Preliminary report expected by Convention time.

Hydro-Cooling Peaches . . . Initially tested and proved successful in research work at Michigan State College several years ago; is now approved commercially and practiced this year in Michigan, Arkansas, and South Carolina. . . . Two hydro-cooling machines installed in Charleston, S. C., area this year used 30 tons of ice daily. Peaches go through 32°F ice water bath in hampers without covers. Brown rot is retarded and grower is allowed to tree-ripen fruit from 48 to 72 hours longer. Growers get 75 cents to $2.00 per bushel premium. Since the object is to rapidly

reduce field heat, mechanical refrigeration is not at all practical because of heavy load involved for short time.

Automatic Production of Prepared Ice . . . Indications are that such a machine for ice plant use should be completed in about a year. Freezing to be completely automatic . . . ice to be solid, hard-frozen, and crystal clear. Machine not to be adaptable for on-premises customers' use.

Channel Icing of Vegetables . . . New method of vegetable icing in retail outlets (channels of ice between rows of vegetables) appears to be effective. Temperatures maintained low enough to provide adequate protection. Only two-thirds as much ice needed compared with ordinary ice display. Labor saved because no ice bed needed under produce. New tests planned. Super Market Institute shows interest . . . may advocate. If so, big new market open.

Vegetable Icing in Mechanical Cases . . . This is being studied by Research Committee. Outlook promising.

Packaged Ice Bags . . . In one large market cubed ice is packaged in nothing but 25 lb. bags. Secret to success: sell dry cubes. All cubes delivered in refrigerated trucks held at temperatures between 18 tq 20 F.

Lengthy discussion of bag sizes disclosed that some bags held as little as 10 lbs. of ice, but they were not too profitable compared with the 25 lb. size. Some icemen think customers will buy more than one bag of the smaller size; but several companies haven't found this to be true.

Unethical Competitive Advertising

When the iceman or the ice industry is reflected in a bad light in any form of advertising or editorial coverage, it is, as it should be, met with stiff rebuttal from the Association office. This was brought out clearly in a full discussion at the meeting. Effective service of The Better Business Bureau is also employed when occasion warrants. It was pointed out in this discussion that the strong objections of icemen to adverse advertising served to emphasize the power of using it to create an impression; by the same token NAII's advertising is equally effective because of the good it can do!

Decontrol . . . Efforts of the Association's General Counsel to keep the industry abreast of legal and government regulations has been worthwhile to the entire membership. One of the most important results of the Legal Department's activities has been decontrol of ice prices.

An Opinion . . . One experienced Board member expressed the opinion that if he were given the choice of any business to be in today — ice cream, milk, or ice, for example — he'd stick to the ice business. Why? . . . Less competitive problems. More opportunities to open new markets. With an equitable price for our ice, we should focus our thinking on dollar volume and forget tons.

On Merchandising . . . One successful operator warned about any practice that cuts down sales. It is vitally important, he said, to see that customers get year 'round service. Example: markets having ice dealers who work the summer months only and leave the customer high and dry in winter.

Ice Makers

"On Premises" Ice Makers . . . It was the general consensus that these machines usually don't stand the test of time. Extreme weather hampers their performance promised by salesmen. They break down. Servicing of machines is almost prohibitive. Don't give up on customer if he buys an ice maker. Be friendly. Assure ready delivery in cases of emergency—at special delivery prices, of course! Always supply good ice and competition won't bother you too much. . . . Some companies keep a record of calls from commercial customers who have machines. Periodically this is shown to the customer with the reminder that he pays a premium for "extra" ice. This should be considered as part of the cost of owning "on premises" ice makers.

Unethical Practices of Truck Drivers . . . Board members expressed an awareness of "unusual" methods some drivers use to fool middlemen at the point of destination as to the quality of their perishable load. No definite conclusion was reached as to how offenses might be offset. United Fresh Fruit and Vegetable Association and Trucking Association among others are aware of these problems and are trying to work out a solution. Board agreed to keep problem in mind . . . is open to suggestions.

Where Do We Stand With the Public? . . . In a self-searching report of the Public Information & Marketing Department it was forcefully pointed out that ice companies don't do enough at the local level . . . Take the public for granted. . . . People in many towns don't know where ice company is located. They lack information as to what type of ice is sold. Public still thinks in terms of block ice. Should be told about benefits, rather than just advertising "Ice for

Sale." Big market exists for crushed ice if properly merchandised. . . . Party Ice offers greatest domestic potential sale. . . . Some companies too slow to get on the party ice bandwagon. . . . Excellent opportunity exists to sell packaged ice to owners of home freezers. . . . Corn icing. . . . Meat-on-Ice and Hydro-cooling are sure-fire profit makers wherever tried. Effective selling tools available to aid in getting the ice story across to commercial customers. . . . Vending machines offer advantage of keeping up with general selling trends toward self-service. . . . Vendors should be properly illuminated at night. . . . Need selling message or signs which offer customer benefits. . . . Leading magazines and newspapers reached millions of customers with ice-using ideas. . . . National publicity and trade paper advertising bringing many inquiries, proving very effective for companies that follow through. . . . Great need for more courtesy on part of platform men. . . . Watch service and sanitation policies. Picnic chests and ice cream freezers are getting bigger play now than in years. Both have been heavily publicized lately.

Costs

Production and Distribution Costs are up sharply and continuing. Most effective solution: installation of more automatic controls in plant and vending machines in distribution. Reduce man-hours without impairing quality of product or service. Automatic bag-tying machines for wire ties now can be purchased on an "on-trial" basis. A new type of adhesive tape is also available for this purpose. Some companies find this ideal for 25 lb. bags. Holds up well, even for 10-mile hauls. Other companies have tried this but found it unsatisfactory. Stapling machines not recommended because of danger of a piece of staple getting into ice.

Refrigerated delivery trucks strongly advocated by representative of one large company. Their trucks get refrigeration power from motor. When idle, unit can be plugged into nearby electrical outlet. All company's cubes delivered into these trucks at temperatures as low as 20 degrees. Trucks parked and plugged in at vending stations help eliminate overtime for Sunday truck drivers.

Some companies having trouble with new and high sewer taxes. One representative reported that as result

of his efforts his company secured substantial relief by proving that water which was frozen into ice and evaporated from cooling tower didn't go down sewer. His sewer taxes reduced close to 80 per cent.

Delivery Costs . . . Check these ideas: One company assigns each driver certain stops each day, thus assuring each customer regular service. Helps eliminate overtime. At current wage rates company cannot afford to have drivers soliciting business; this can be done more economically by employing trained salesmen. . . . Another company figures its customers will avail themselves of a lower rate by buying two bags of ice instead of one . . . and will buy every other day.

Dealer Compensation

Here's a unique system reported by one member: It is called dealer compensation. From May to October a special fund is set up—50c to $2.00 per ton, depending upon total tonnage of dealer. From November to April, a refund of his accumulation goes to each dealer. This makes for more uniform pay check weekly . . . discourages him from working just during peak hot season. During six-month off season company makes refund weekly at rate of 1/26th of dealer's total amount on deposit.

Vending Machines . . . Some tips on promotion: Go all out to dress 'em up! A well lighted vendor invites a woman customer to stop by at night without fear. Vendors look so attractive customers comment on appearance as credit to the neighborhood. All painted uniform color. Blotters advertise new stations to surrounding area. In wealthier areas more elaborate media is used.

Creating New Ice Business . . . One company started blowing ice over cargo in vegetable and milk trucks. . . . Now has blowers at three platforms. Much dairy business is being neglected, it seems. Also the icing of milk on routes is worthy of serious promotion. One dairy took from 18 to 20 tons of ice per day.

Get to know the local caterers, acquaint them with ice uses such as "glamour-icing", ice carving, convenience of ice company ice cubes in the home. Ice punch bowls for special occasions offer new market in the home and for banquets and receptions at hotels. Bring good prices. Moulds are available from California firm. Snow ice can be used for packing around stems of roses for shipping. Sales contests and hard work have produced many sales of ice refrigerators in some areas.

At a recent Home Economics show much interest was aroused in the NAII ice exhibit by adding food coloring to snow ice which surrounded various dishes. A simple idea to aid in the sale of crushed ice that attains a glamorous effect! Good Xmas item.

Sanitation Ideas . . . One company, after trying most every type of container settled for galvanized cans. It questioned appearance, but at least was assured of not breaking any sanitary code. In at least one city the local Health Department warned the ice company that it would be a misdemeanor to leave any type of returnable canvas bag or other receptacle with customers. One company leader deplored the unsanitary condition of some plants, mentioning dirty ice he had seen recently. Premium service goes out the window when the product fails to live up to strict sanitation in manufacture and delivery methods.

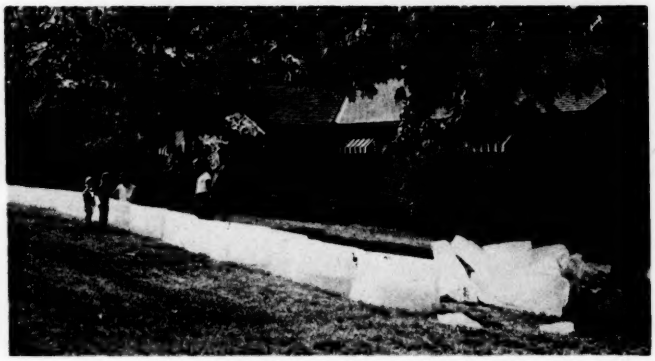
There Is Much About Ice That Should Be Explained to the Public . . . One Industry leader and successful operator emphasized that more than ordinary sanitation is needed. Lack of public acceptance is caused partly by lack of understanding by ice industry itself that ice and service are really worth something. Our thinking needs changing. Our appeal now is to an audience which came out of homes that never used iceman's ice. They know little . . . therefore are open-minded . . . about it. It takes promotion and advertising to get our points across. In his city, taxicabs pick up and deliver ice for price of ordinary fare. In his company's advertising, use of home freezer is suggested as storage place for iceman's ice.

Drive For New Members . . . Unanimous approval of the current drive for new members was very much in evidence at this meeting. As one iceman put it: In view of ideas set forth in this session, it stands to reason that NAII offers a whale of a lot to its members! President "Bill" Ayers was highly commended on instigation of membership campaign. . . . Increased membership, it was agreed, could do wonders for developing more projects to help increase ice business. In view of what NAII has to offer, 6 mills per ton is a mighty low asking price!

Michigan Ice Plant Closes

THE ONLY ice manufacturing plant in Jackson, Mich., founded 102 years ago and operated by the same family until last January ceased operation October 1. The 125-ton plant was said to be unprofitable. Two concerns are considering taking over the customers and bringing ice from nearby cities.

Ice Man Waters His Lawn With Ice



Lawn of Mr. and Mrs. Phillips cooled and watered with blocks of ice.

A BRAND new use for ice has turned up at North Little Rock, Ark. this summer, at the home of Mr. and Mrs. L. A. Phillips. Mr. Phillips, in the ice business with the Consumers Ice Co., has been hauling white ice, which can't be sold, from his plant to his home. That way, he avoids requests for free ice and waters his lawn. The neighborhood children also appreciate the cool playground. For next summer Mr. Phillips plans to work out a contract to supply neighboring lawns with ice during the hot days.

The Control of Hazards in Ice Plants

By R. H. SMITH
Railways Ice & Service Co.
Willard, Ohio

This article is reprinted, by permission, from the Monitor, published by the Ohio Industrial Commission, Mr. Smith is Chairman of the Safety Committee of the Ohio Association of Ice Industries.

ALMOST every industry has hazards that are peculiar to its field, and the ice industry is no exception. Three common hazards are the cause of most accidents in ice plants: (1) lifting; (2) slipping; (3) falling.

Lifting accidents occur principally from lifting of the ice itself in pieces or cakes weighing from 50 to 400 pounds. *Slipping* accidents are caused by the ice slipping from the purchase of the tools used or from slipping of the feet. *Falling* accidents occur from cakes of ice tipping over and striking some part of the body, or from falls of persons themselves when handling ice.

To control these hazards, proper instructions are given employees on how to lift and set down ice, with the legs performing the main function so as to relieve possible strains of the back. The right kinds of tools are provided to prevent slipping accidents. These tools are maintained in good shape, as to sharpness of ice tongs, breaker bars, picks, etc., and the employee is instructed as to their use and handling.

Floors are kept clear and clean. Good housekeeping is the best preventative against the hazards of falls. Storage and platform floors that are swept and kept free of spawls, and otherwise maintained in good condition, will practically eliminate the hazards due to falls.

Safety-toed shoes are worn for added foot protection.

Ice is inspected for cracked cakes or broken corners before handling.

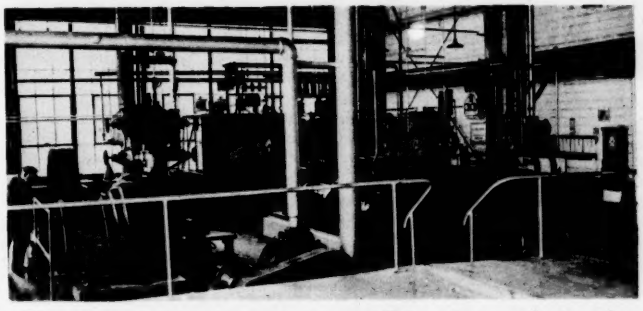
In short, the institution, maintenance and adherence to a well defined safety program is the main control against these common hazards as well as those other hazards, such as traffic, electrical, ammonia, railroad refrigerator car icing, and delivery.

Hoists do much to eliminate the dangers involved in lifting blocks of ice.

A worker demonstrates proper method of upending a block of ice. This minimizes chance of back sprain.

In 1936 the Ohio Association of Ice Industries, realizing the importance of safety from an industry standpoint, organized and instituted the first Association Safety Committee, and in cooperation with the Division of Safety and Hygiene conducted the first State-Wide Safety Campaign. This has been carried on every year since and has become one of the most important of Association endeavors. Individual awards are made to both individuals and company operators.

It can truly be said that the efforts of the Association and the Division of Safety and Hygiene of the Industrial Commission of Ohio have made the ice industry of Ohio safety conscious. Its record of safety achievement ranks at the head of all unit ice associations that make up the National Association of Ice Industries.



This photo of an engine room in a small ice plant emphasizes the importance of good housekeeping as a safety factor.

The Ice Industry

David C. Copeland Joins American Service Company

THE AMERICAN Service Company has announced that David J. Copeland of Richmond, Ky., has joined its official staff in the capacity of vice-president, effective October 1. Mr. Copeland has been general manager of the Richmond Ice Company

David C. Copeland

for several years. During that time he has been an active participant in ice association work. He served as president of the Kentucky and Indiana Associations of Ice Industries, as a member of the Executive Committee and as a member of the Research Committee of the National Association of Ice Industries. He thus brings to his new position a wide range of experience in the ice business, and an acquaintance with most of the leading ice executives of the country.

Florida Ice Plant Increases Capacity

NEW ice storage rooms, increasing the storage capacity of the plant approximately 7,000 tons have been added to the ice plant of the Royal Palm Ice Company at Wildwood, Fla. at a cost of approximately $100,000.

Cinder blocks were used in the erection of the building, with the walls of double block construction and twelve inches of insulation between the walls. The room is refrigerated by a battery of blowers thermostatically controlled and automatically defrosted. The rearranging of present equipment, together with some additional compressors, increase the manufacturing capacity as well as the storage capacity of the plant.

Ice manufactured at the plant is is used primarily for refrigerator cars.

Ice Depot Provides Service

THE MIDDLETOWN Ice and Coal Company, Middletown, Ohio, has constructed an ice storage depot and sales platform on U. S. Route 25 at the south edge of Troy, Ohio. This depot was constructed to provide an outlet for furnishing ice service to Troy and the surrounding territory. This market was formerly serviced by Troy Ice and Coal Company which discounted manufacture and sale of ice on August 1, 1952.

The building for the depot is 20 feet by 30 feet of concrete block construction, 8-inch block outside, 6 inches of ground cork insulation and 4-inch block inside. Refrigeration is furnished by a Frick Freon condensing unit. The ice storage room contains 650 feet of 1¼-inch flat type ceiling coils.

Total cost of the building and equipment was about $10,000. Location of the depot on Route 25 is convenient for service to refrigerated transport trucks and a drive is arranged so that these trucks may be serviced efficiently with straight drive in and drive out service.

Driver Wins Safety Emblem

EDWARD J. HICKEY, with 16 consecutive years of driving for Wisconsin Ice & Coal Co. without an accident, leads the firm in safe driving records. Hickey and other drivers were presented with National Safety Council emblems by John H. Kopmeier, vice president of the company, at a recent dinner meeting.

Ice Company Honors Workers

THE NATIONAL Ice and Cold Storage Company at Sacramento, Calif., recently announced the names of employees who had been with the company from five to 48 years. Forty-eight employees were awarded service recognition pins by Millard W. Young, vice president and general manager at ceremonies in the Hotel Sacramento. Special honors went to Charles L. Pratt, who has 45 years of service. Next highest in service is P. D. Kelly who has been with the company 30 years.

British Ice Show

THE first operette on ice to be staged in England was launched August 7 at the new Mayfield Ice Rink, London, with tremendous success. More than 120 skaters from stars to corps de ballet put over "Rose Marie" to give the new ice rink, opened after 13 years of war and post-war service to the government, a magnificent start.

Normally this organization plays at theaters where no convenient ice exists and where they have to provide the basic material on which their ice shows are staged. As part of the team of technicians accompanying the show, go three refrigerating engineering experts. Their job is the assessment of problems and potentialities of theaters, solution of the difficulties, and installation of the equipment after assessment of the layout.

PRICE CONTROLS DON'T WORK

They were tried by:	And
Hammurabi of Babylonia in 4000 B.C.	Smothered entire economy.
Athens in 4th Century B. C.	In spite of death penalty for violations entire control system collapsed.
Diocletion in 301 A. D.	Impoverished whole Roman Empire.
England at end of 12th Century	Parliament forced to repeal controls "in the public interest."
Antwerp during Dutch Revolution	Destroyed incentive and cut off supplies to the city.
Lower Bengal (India) in 1770	Low ceiling price on rice caused consumption of all supplies before next harvest; ⅓ of population starved to death.
American Colonies on numerous occasions	Continental Congress adopted resolution declaring price controls "productive of very evil Consequences."
England for 13 years now	Prices have risen as far and as fast as U. S. prices.
France 1939-1948	Cost of living has risen nearly 20 times as much as in U. S.

Reports from Unit Ice Associations

Northwest Association of Ice Industries

L. F. MARSH, Exec.-Secy.

THE annual fall conference of the Northwest Association was held at Everett, Washington, October 3 and was attended by a very good representation of the association. It was a very interesting session. Practically every main problem of the industry was discussed and those present got the ideas of every other one present on each subject.

Most of the members present reported that they were getting more or less business with "Meat on Ice" and it was also reported that the butchers in their cities were becoming more and more interested in this "Meat on Ice" proposition. Without question there will be more ice go into meat cases in the future and it is a promising new outlet making profits for the butcher and for the ice man wherever it is used.

There was a noticeable trend of dollar and profits thinking rather than tonage thinking among the ice men at this conference. It seemed to be the opinion of most of them that the ice man has been more price conscious than his customers. A few members have always had the desire to "give the customer what he wants, but get a price for it that permits a profit on the business," but these members have been considered out of line by the majority in the past. It seems that this is changing, that more of the members are thinking less of importance of price, more of the importance of giving the customer what they want and putting the price where necessary to make a profit.

Most of the members reported business good, many were out of ice and having to ship it in, or get it somewhere outside of their plants which is an unusual condition for this time of year. There was a sufficient capacity of production to cover all the requirements but a little effort was required to get the ice where it was needed when it was needed.

The American Ice and Cold Storage Co. of Everett, and Art Soli the manager will be remembered by each one who attended this conference as gracious and generous hosts. Without question every one of those present had a good time as well as a profitable one from the business standpoint.

The annual convention will be held at the Empress Hotel in Victoria, B.C., March 25-27, 1953. This is several months in the future but it is not too early to begin to plan on attending. The program committee promises a convention that will be full of ideas that can be put to work for more profits from this ice industry, and for pleasure, comfortable relaxation and enjoyment in an unusual and entrancing spot for the Empress Hotel is an ideal spot.

Canadian Association Of Ice Industries

MILDRED E. CROFT, Exec.-Secy.

THE annual convention of the Canadian Association of Ice Industries held at Ste. Adele, Quebec October 21 and 22 was very successful. The feature of the convention this year were round table discussions at each business session. One major topic was discussed at each session and this was followed by a general discussion with all delegates participating. This was made possible by having tables and chairs set up in horse-shoe fashion so that everyone was made to feel that they were part of the program.

There will again this year be a delegation of Canadians attend the National Association of Ice Industries' convention in Cincinnati November 11 - 14.

John McGoey of Kitchener, Ontario, one of the Directors of the Canadian Association, spoke at a session of the Retail Merchants Association of Canada (Foods Division) Convention on the topic of 'Meat-On-Ice'. His talk was very well received by the delegates and his paper was from all accounts one of the most outstanding given during the convention. He was supported by a number of Association members who all wore red roses in their lapels so that they could be readily identified. The purpose of the red roses was to let the delegates of the convention know that there were a number of Ice men present who could answer their questions. These ice men were sitting among the delegates and at the close of the session, delegates to the convention asked them many questions.

It was indeed fortunate that the Canadian Association of Ice industries had made arrangements with the Retail Merchants Association to appear on the program as it was evident that many of the delegates, especially those from smaller centers had not heard of this new form of meat merchandising.

Southwestern Ice Manufacturers Association

THE FALL Conference of Engineers of the Southwestern Association was held at the Baker Hotel, Mineral Wells, Texas, October 21 and 22, arranged by William S. Cooley, Chairman, and other members of the Technical Committee.

Among the topics of critical discussion were: Placing the plant in moth balls for the winter months, and processing, handling and bagging of crushed sized and cubed ice. One of the three-sessions was an open forum in which particular problems were discussed on a free-for-all basis, led by a panel of experts. The theme of the conference was to help reduce costs and improve efficiency in plant operations.

Michigan Ice Industries Association

EDWARD W. JACKSON, Secretary

THE MICHIGAN Ice Industries Association plans to hold its 36th annual convention February 17 and 18, 1953 at the Detroit-Leland Hotel, Detroit, Mich. The tentative plans indicate an event which will be of great interest and benefit to the members of the industry. Details will be furnished later.

The Association conducted a spring conference in May of this year, and a fall conference September 18, both at Lansing, Mich. These conferences were well attended and great interest and enthusiasm were shown by those present, all of whom participated freely in the discussion of the various problems in the industry.

Gulf Coast Ice Association

THE Gulf Coast Ice Association including South Alabama and Northwestern Florida held a meeting Thursday, October 30, at the Country Club, Evergreen, Alabama. J. W. Nipper presided. At the business session public relations, distributors, merchandising, research, technical problems, budget and finance were discussed.

Among speakers were Vester Gamble, Florala, Ala.; Joe Quinlevin, Mobile, Ala.; Guy Spearman, Sr., Pensacola, Fla.; J. F. Kilbourn, Panama City, Fla.; Dutch Geiger, Bill Anderson, L. Nettleship and L. E. Johnson.

Delta States Ice Association

R. N. MILLING, Secretary

THE various committees are working hard to provide a well balanced program for the annual convention of the Delta States Ice Association to be held at Jackson, Miss. November 23-24. This program will consist of pertinent, progressive information, coupled with entertainment, relaxation and good cheer.

It will cover the following subjects: economy in production; processing, handling and bagging of sized, crushed, and cubed ice; hidden profit leaks in the ice industry; the ice industry of the future; meat on ice; local advertising, panel discussion of present day problems; other pertinent subjects.

A complete entertainment program is planned, to include the president's social hour, everybody invited; ladies' luncheon; tour of the capitol and governor's mansion; bingo games with added attraction; ladies' coffee hour; banquet, floor show and dance.

Florida Ice Men Hold Annual Convention Discuss Industry Problems

ATTENDANCE records were broken when Florida ice men, their ladies, guests and associate members convened in the Hotel Floridan in Tampa, October 12-14 to celebrate their 27th annual convention. The meeting was opened with a new, but no doubt continuing feature this year —a golf match and participants were most enthusiastic in their praise of the sporting event.

J. F. Causey of Miami, Fla., walked away with the silver cup and covers for his irons; C. P. Austin, representing NAII won a unique ice bucket; Herman Osteen of Miami, Fla, won a gadget that can be used to stamp names on golf balls. The prizes were awarded at the President's dinner dance by J. S. McLemore, chairman of the golf committee.

Tampa ice manufacturers officially welcomed those in attendance at a cocktail party Sunday evening. Everyone was made to feel at home, old friendships were renewed and new ones made at this social function which serves to get all delegates together and acquainted early.

Opening Session

The first business session of the convention was called to order by President R. A. David at 9:30 a.m. Monday, October 13. Rev. Robert E. Lee, pastor of the Bayshore Baptist Church of Tampa, gave the invocation, and A. K. Dickinson, Director of the Convention Bureau of Tampa greeted delegates.

President David reviewed the activities of the Florida Ice Association during his term of office and thanked chairmen and members of committees who had helped to make it successful.

Distinguished guests and associate members were recognized and members of the Auditing, Resolutions and Nominating Committees were asked to prepare their reports.

Due to illness, Dr. A. P. Black, head of the Chemistry Department of the University of Florida and one of the outstanding authorities in the south on water treatment, was unable to discuss "Some Recent Developments in Water Treatment."

S. E. Rosenberger, Assistant Vegetable Crop Specialist with the Agricultural Extension Service at the University of Florida, covered well the subject "Retail Produce Icing."

Past President J. S. Ostner introduced Theo. Hamilton, Jacksonville, attorney. Mr. Hamilton has been engaged actively in labor relations law practice, representing management, and dealing chiefly with administrative agencies. His presentation entitled "Labor Pains and What to do Until the Lawyer Gets There" was interesting, factual and understandable.

Some of the points he stressed were: Get closer to your employees, pay good wages, have good working conditions, keep abreast with what other people are doing, take advantage of all your rights, don't try to handle your own case. Get some one who knows the law. Don't take steps in a labor case unless you know what you are doing. He asked his listeners to remember these three don'ts: (1) Don't threaten, (2) Don't promise, and (3) Don't inquire. He volunteered to answer questions and was kind enough to continue to answer the many questions put to him long after the session was scheduled to close.

Resolutions

As the first order of business, J. K. David, chairman of the Resolutions

Past-president R. A. David turns gavel over to new president, J. R. Gramling.

Officers and members of Executive Committee, Florida Ice Association. Seated: Past-president R. A. David; new president J. R. Gramling; Vice-president R. C. Browne; Executive Secretary Muriel Washburn; Standing: Members of the executive committee, J. L. George, W. C. Airth, J. M. Barnes, S. C. Clarke, D. W. Browne, L. E. Johnson, E. B. Stewart.

Committee, read a Resolution of Condolence regarding the passing of Mrs. H. R. Kahler, wife of our long faithful treasurer.

The second resolution conferred a life membership on past president Herbert R. Beers who has sold his ice plant. It cited his many years of willing service in the Florida Ice Association and expressed the love and admiration in which he and his wife were held by everyone in the ice business in this state.

A resolution of thanks was extended to the President and the Secretary for their Association efforts during the past year, and a general resolution thanking all participants and convention committees closed this feature of the program.

New Dues Program

A new monthly dues collection program sponsored by the Budget and Finance Committee and indorsed by the Executive Committee, was presented to the membership at this time.

The system which will go into effect January 1953, sets up in groups, standard rates for plants that sold certain tonnage during the past year. Each ice plant owner was asked to fill in a card specifying the classification in which he should be placed and to pledge his support of the program. A vote on the new system was asked for and it passed unanimously.

Officers Elected

The Nominating Committee's report was presented by E. E. Melton, a past president of the Association. The recommendation that the following slate of officers be elected was passed by a unanimous vote:

President: J. R. Gramling, Arctic Ice Co., Plant City, Fla.

Vice-President: R. C. Browne, Royal Palm Ice Co., West Palm Beach.

Treasurer: H. R. Kahler, City Products Corp., Miami, Fla.

Executive Secretary: Muriel Washburn, Jacksonville, Fla.

New Executive Committee members: Senator W. R. Hodges, Cedar Key; J. M. Barnes, Quincy; S. C. Clark, Jacksonville; R. A. David, Jacksonville; D. W. Browne, New Smyrna Beach; J. S. Ostner, Jacksonville.

In accepting the presidency, Mr. Gramling asked for the cooperation of all members and pledged to give the office his best efforts.

Use of Electric Service

President Gramling performed his first duty by introducing A. H. Bruning, Director of the Industrial Development Division of the Florida Power Corporation. Mr. Bruning discussed with authority a subject every ice manufacturer wants to know more about; namely, "Efficient Use of Electric Service in Ice Plant Operation."

Industry Clinic

A. Sterling Hall, Manager of the Manatee Ice & Cold Storage Co. of Bradenton, ably acted as moderator of the Industry Clinic.

George Stovall as the first speaker on the Clinic discussed "Dealer Relations." He placed special emphasis on sales meetings, a thorough knowledge of the superiority of the product, it's many uses and clean trucks and uniforms.

"Truck Icing" was handled by J. S. Earman. Mr. Earman has built up a tremendous business in this field. He suggested truck icing stations be placed on the outskirts of towns and that accommodations be furnished such as a restaurant, filling station and sleeping quarters for the drivers.

B. F. Thomson, manager of the All Seasons Ice Co. in Jacksonville spoke on the subject "Competing with Small Ice Makers." He told his listeners that salesmen for the many types of these machines were working diligently day and night to take away their luxury ice markets and that they should fight this serious threat with vigor.

In discussing "Vendors," Guy Spearman, Jr., warned ice men to be prepared to keep some one available at all times to service the equipment and he suggested they be operated by twenty-four hour a day filling station operators, grocers or others. He quoted tonnage and profits on four vendors they operate in Pensacola and assured delegates that they were money makers.

Sarge O'Neill, meat market manager extraordinary from Miami Springs, Florida, told ice men he was sold on ice for his red meats and poultry because it keeps them red, moist, eleminats trimming, saves time and with ice appeal, there is always buy appeal. Mr. O'Neill has won two national awards for his dis-

plays of red meat and poultry on ice.

Questions were asked after each presentation on the clinic and all convention delegates agreed that this was one of the most interesting and enlightening features of the program.

Dinner Dance

The President's Dinner Dance was held at the famous Crystal Ball Night Club on Bayshore Drive in Tampa and all in attendance at this gala affair spoke highly of the food, floor show, dance and beauty of the ladies who wore their lovely orchids (gift of the Association) with their evening and dinner dresses.

Final Session

The third and last session of the convention was opened by C. P. Austin, Director of the Research Department of the National Association of Ice Industries.

Mr. Austin's title was "It's Your National Association" and he graphically outlined the many services rendered each and every member of the National organization and listed the accomplishments of the Association during the past year. He stated that it was through their and industry leader efforts that ice had been decontrolled and that every department worked at all times for better conditions for the ice men in this country.

Insurance Rates

O. M. Stallings, chairman of the Workman's Compensation Committee of the Florida Association of Insurance Agents presented facts and figures on insurance rates on ice manufacturing plants in Florida and other states and explained in detail why rates had gone up in recent years. He pointed out that a company could lower its rate if it cut down its rate if it cut down on needless accidents.

The Political Picture

The Hon. George Smathers, Junior U. S. Senator from Florida, closed the convention with an inspiring nonpartisan address on the current political situation. The voters, he said, should decide on the political candidate they vote for on the basis of which candidate they believe is best for the nation's welfare rather than on party affiliation.

The Senator concluded his speech by telling the ice dealers, "I'm not here to tell you how to vote." But he warned, "you had better get interested in this business of government. A government can take away from you everything that you hold dear."

Railroad Car Icing Defended

TO REFUTE a newspaper story attacking "reefer" icing, H. W. Tolle, Citizens Ice & Coal Company, Mattoon, Illinois took vigorous action. Robert R. Young, founder of the Federation for Railway Progress was quoted in the Mattoon Journal Gazette as calling the use of ice in refrigerator cars time wasting, expensive, harmful to cars and roadbeds. Mr. Tolle contacted the newspaper and offered to supply the true facts, asking only for space equal to that given Young. The request granted, he answered the damaging statements. The newspaper ran his reply in three separate articles, occupying several times the space of the derogatory remarks.

Ice Safety Record Declines

IN AN OPEN letter to all ice plant owners, Sloan Childers, chairman of the Ice and Cold Storage Division, National Safety Council, points out the unenviable accident record of this industry. Frequency rate is 51.09 lost time accidents for each million man hours worked, third highest in the United States. Severity rate is 3.31 days lost for every 1,000 hours worked, fourth highest nationally. He estimates that accidents cost ice plant operators a total of 18 million dollars annually.

Billboard Advertising Will Tell The Ice Story In Indiana

BILLBOARD advertising is now available to ice distributors in Indiana through the Indiana Association of Ice Industries. A series of three posters have been designed, all of them advertising extra ice for parties, picnics, etc. There is an increasing demand for this type of ice service and it is expected that these billboards will provide an excellent program for educating the market on available outlets for crushed ice.

This two-color poster with a blue background is the first of a series of three billboards designed for use of members by the Indiana Association of Ice Industries.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

NEWS

OPERATING

MAINTENANCE

QUESTIONS -- ANSWERS

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EXECUTIVE OFFICE
435 North Waller Avenue
Chicago 44 • Illinois

THIS MONTH

A program of papers and reports that will be up to the usual high standard, and an entertainment program that the Dallas Chapter has gone all out to prepare, is ready for the annual convention of the National Association of Practical Refrigerating Engineers - November 11-14.

Chapter reports indicate stepped up activities on educational and social lines. The membership contest waxes hotter and hotter.

Multiple answers are coming in on Questions in the Question Box.

Gala Entertainment Program Beckons All NAPRE Members

THE DALLAS Chapter has gone all out to prepare an entertainment program that will match almost item for item the educational program planned for the national NAPRE convention on November 12, 13 and 14 at the Adolphus Hotel. This Texas Chapter places such emphasis on the entertainment end of the convention, that none other than the president of the Chapter himself, Tom Wetherford, Jr., has headed up the entertainment committee.

Mayor J. D. Adoue of Dallas is to make the welcoming address to the convention at 10:00 A. M. November 12 in the Danish Room of the 16th floor of the hotel.

Ladies' Entertainment

Ladies of the members in attendance will find very little time on their hands. Starting Wednesday noon, November 12, the Dallas group has arranged a luncheon and style show at the Mural Room of the Baker Hotel located just across the street from the Adolphus. This style show will be presented by the world-famous Neiman - Marcus Department Store. The entertainment chairman insists that this will probably be the high light of the ladies' entertainment, (and probably the most expensive from the standpoint of the male delegates too.).

On Wednesday evening, following the Bureau of Refrigeration Information session, there will be an informal get-together of the delegates visitors and their ladies. At previous conventions this affair has always been the best opportunity for all to get re-acquainted and swap personal yarns of experiences since seeing one another at the previous meeting.

Luncheon and Visit to Alford Warehouse

Social activities on Thursday start with an informal men's luncheon. This is the usual conference on local and national operations. In mid afternoon the entire convention will be the guests of the Alford Warehouses. Through the courtesy of Fred Alford delegates, visitors and their ladies will make a visit to the world's largest refrigerated warehouse. The Alford firm has specially built trailers with comfortable seats available for transportation during this inspection tour. Before the tour, E. R. Hallowell, who designed the refrigeration facilities of this plant will make a short talk in the plant auditorium on the design and operation of this warehouse. Transportation from the hotel to the warehouses will be provided by the Dallas Chapter.

Tom Weatherford Jr., Dallas, Tex.
Chairman Entertainment Committee and President Dallas Chapter

Dinner Dance

The annual dinner dance Thursday evening will be held in the Danish Room of the Adolphus Hotel. Music will be provided by H. W. "Rip" Giersdorf, musical director of KRLD-TV station. Rip is well known for his daily TV shows in the Dallas area as well as his sparkling entertainment at the Dallas Athletic Club, Northwood and Lakewood Country

Clubs. The orchestra will be under the personal direction of Mr. Giersdorf.

Menu for the dinner is not completed at the time this magazine goes to press. However, our Texas friends assure us that they will not allow us to leave their hospitality without doing ample justice to the choice beef for which their section of the country is particularly known.

Friday November 14, will have its share of social functions too. In the early afternoon the Texas hosts have arranged for a preview of one of the better movies to be released yet this year. This special screening has been arranged with Republic Pictures Corporation and will be held in their studios. The Texas delegation has arranged transportation from the hotel to the studios. None of the ladies will want to miss this feature.

Gala Stag Party

Friday night all members attending the convention will be guests of the Dallas Chapter at a Gala Stag to be held in the auditorium of Alford Warehouses. Transportation again will be provided by the members of the Dallas Chapter. Tom Wetherford writes, "I don't know what you can write about a Stag Party, but we are exerting every effort to make this one the best that any of our members have ever participated in." Youngbloods Southern Fried Chicken and refreshments will be served at the Stag party.

Throughout the convention a suite of rooms in the Adolphus hotel have been reserved for the purpose of extra curricula activities for all attendants at the convention, through the courtesy of D. V. Bancock, of the Bancock Maintenance Company. Bro. Bancock is co-chairman of the convention committee.

Committee Chairmen

Other committee chairmen cooperating to make the convention a success are: W. W. Blocker, housing; W. F. Graham, publicity and advertising; J. D. Sims, finance; L. P. Reiss, registration; and O. K. Irvine, welcoming. Co-chairmen are Warren Cunningham and D. F. Bancock. Prof. H. G. Veneman is Educational Chairman. F. B. Diek, secretary has served all committees. All these members will be seeing you in Dallas.

N A P R E
Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

More on Question 930
Heat Content, Total Heat,

Question No. 930. I have been studying psychrometric charts. One of them uses the term *Heat Content,* **another uses** *Total Heat,* **a third uses** *Enthalpy,* **and a fourth uses** *Sigma Heat.* **Do they all mean the same thing? If not, will you please explain the difference between them? — M. E. W.**

Correction: In the seventh line of the second paragraph of answer to this question in the September issue, the word *dry* should be changed to *wet.* A further explanation of the difference between *enthalpy* and *Sigma heat* may be found in Lesson 12 of "Refrigeration Theory and Applications."—H.G.V.

ANSWER No. 2: Total heat, enthalpy and Sigma heat (Sigma function) are all expressions used to indicate the *difference* in heat energy between a fixed datum and the condition under consideration. They do not necessarily mean the same thing, although at saturation the total heat and enthalpy values are the same. The Sigma heat content is *always* equal to the enthalpy value minus the heat of the liquid at the wet bulb temperature and at saturation is equal to the enthalpy or total heat value minus the heat of the liquid of the moisture present.

Generally speaking, in the comfort range, results sufficiently accurate for all practical purposes may be obtained *directly* from any of the available psychrometric charts. However, below freezing or at temperature above the ordinary comfort cooling range, the appropriate correction factors must be applied to avoid large errors. The important thing to remember is that *differences* in heat energy and not absolute values are involved. Hence values from different charts cannot be mixed indiscriminately. A detailed mathematical explanation of the various terms may be obtained from most any good book on psychrometrics.—J. R. PROSEK.

Ice Making Water Ratio

Question No. 934: In water consumption in a modern ice plant, what portion or percentage of the water consumed is used in ice manufacturing, that is, the product itself; what percentage of consumption goes to sanitation, that is, can washing etc.; and what percentage goes to loss and/or use in cooling, that is, cooling towers, evaporative condensers or water cooled condensers?—H.E.McE

We are fortunate in having answers from three well known experienced engineers on this question, viz: Geo. Bright, LeRoy Etzel, and Ken Holaday. Because of their various approaches to its solution we are publishing all three answers.

ANSWER No. 1: Most of our ice making data is ten or fifteen years old. However, we formerly, in our best plants, consumed approximately 50 cubic feet of water per ton of ice produced, or approximately 3,000 lbs., of which 77 per cent went into the ice, 10 per cent in the tower and 13 per cent for thawing, washing and other purposes.

Other plants which operated efficiently, consumed 60 cubic feet of water per ton of ice produced, using 64 per cent for ice, 16 per cent for tower and cooling, and 20 per cent for thawing, washing, and other purposes.—GEO. BRIGHT.

ANSWER No. 2: Answering this question, it is dependent on the type of equipment used. Assuming it is a cooling tower installation and circulation from 3 to 5 gpm per ton of refrigeration, you would encounter the following losses:

On spray towers the drift loss would run as high as 3 per cent on windy days. On mechanical towers about .2 per cent. Say 1.4 per cent for the average between high wind and gentle breeze.

One per cent of water pumped will be evaporated for each 10 degrees of cooling.

One per cent of makeup will be wasted to sewer to keep concentrations below five to eliminate scale.

Usually the blow-down will be sufficient for can washing, but state health laws prohibits its use, so this will have to come from the main supply.

Assume this is a 100-ton ice plant, using from 3 to 5 gallons per ton of refrigeration over tower, or an average of 4. Allowing for scoring of cakes and meltage in dip tub, it will be necessary to make 320 lb. blocks or 106 tons of ice.

$$\frac{106 \text{ tons} \times 2{,}000}{8.3} = 25{,}541 \text{ gallons}$$

for filling cans.

1 ton of ice = 1.6 tons of refrigeration.

$4 \times 1.6 \times 106 = 678.4$ gpm on tower.

$678 \times 60 \times 24 = 979{,}200$ gallons pumped per 24 hours.

2.4% evaporation loss and wind drift—23,500 gal. per 24 hr.—33.3%.

1% blow-down—9,792 gal. per 24 hr.—13.8%.

1% can washing—9,792 gal. per 24 hr.—13.8%.

Filling cores and other uses—2,000 gal. per 24 hr.—2.9%.

Filling cans—25,541 gal. per 24 hr. —36.2%.

Total—70,625 gal. per 24 hr.

—LeRoy Etzel

Answer No. 3: Referring to the question on water consumption for ice making, this is the type of question that can be answered in three ways: (1) with one brief sentence, (2) at some length, or (3) by writing a book.

If you are crowded for space, use method (1) and answer it this way: It takes about two tons of water to make a ton of ice.

If you want more detail use method (2) and indicate the various items that make up the total water requirements. There are two elements of water consumption that go into the block of ice itself. The data for method (2) is shown below:

I won't develop method (3) by writing a book just now, because (a) it would take too long, (b) you wouldn't have space in the Question Box column, and (c) I don't know enough about the subject. However, running down the hypothetical table of contents, I can see a number of clues to possible savings in a plant that may need to conserve its available supply:

Overweight adjustment on the can filler.

Conservation of refrigeration and water by heat exchangers.

Utilization of compressor jacket water.

Mineral quality of water and its effect on softener losses, coring procedure, and condenser requirements.

(a) Nominal weight per ton	2,000 lbs.
(b) Overweight to allow for shrinkage in dumping, storage and delivery, assume 7½%	150 lbs.

Other increments of usage are related by water conditioning and operation of refrigeration equipment.

(c) Filter washing and softener sludge losses, assume 10%	215 lbs.
(d) core water loss will depend on the mineral content and nature of impurities, assume 7½% of 2,150 lbs.	161 lbs.

(e) Thaw tank losses will vary over a considerable range, but are not likely to be less than this figure: Assume that 1% of the ice has to be thawed for dumping; ice is harvested at 14° F, and temperature drop through the thaw tank is 10° F.

Heat required to warm ice, (32-14)/2	9 Btu/lbs.
Heat required to thaw	144 Btu/lbs.
Total	153 Btu/lbs.
To dump 2,150 lbs., total heat required:	
$2{,}150 \times 0.01 \times 153 =$	3,300 Btu
Divide by temperature drop, 10° F, which equals	330 lbs.

(f) To figure water requirements of refrigeration equipment, first compute unit refrigeration requirements. Assume that water supply comes in at 90° F, and brine is 14° F, and losses, including radiation amount to 15%.

It takes, to cool water (90-32)	58 Btu/lbs.
to freeze water	144
to cool ice (32-14)/2	9
to cool discarded core water (90-32) × 0.075	4
for radiation (15% × 215 Btu)	32
	247 Btu/lbs.
Total for 2,150 lbs. =	531,050 Btus.
This total is low by an amount equivalent to the storage room load. If this factor is 20% the overall refrigeration requirements amount to approximately	635,000 Btu/ton
	or 2.2 tons refr/ton ice

Heat is dissipated in the cooling tower or spray pond at the rate of 970 Btu/lbs. of water evaporated. Make-up for evaporation is therefore 635,000/970 — 655 lbs.

(g) Assume that conditions are such that it takes 3½ gpm circulating water per ton of refrigeration and 2% drifts away in the wind.

Windage loss, $2.2 \times 3\frac{1}{2} \times 1{,}440 \times 0.02$	222 lbs.

The sum of these seven major elements indicates an overall requirement of	3,733 lbs.
	or 448 gal./ton of ice

NAPRE Department

Factors affecting losses in cooling towers, spray ponds, and evaporative condensers.

Effect of auxiliary storage capacity on water requirements.

Full discussion of these subjects would bring out the fact that water requirements vary over a considerable range, depending on design factors and local conditions. The conclusion of the book would doubtless state that the operator who produces a ton of ice with two tons of water or less, is doing a good job; if he is taking much more than two tons (480 gallons) of water per ton of ice, it will probably pay to analyze his operations to determine how many of the losses are controllable. — Ken Holaday.

Milk Tank Insulation

Question No. 935: Two new milk storage tanks are to be installed in the dairy plant in which I am operating. Space in the room selected is not adequate and it has been decided to knock out the wall between the room and a covered loading platform. After the tanks have been installed the wall will be restored. The contractor insists on installing a band of 2 inches of corkboard insulation on the circumference of the tank between the tank and the new brick work in the walls. The tank manufacturer installed 1½ inches of insulation at the time of manufacture between the inside stainless steel liner and the exterior painted metal shell. Why does the manufacturer insist on the additional insulation?—J.R.K.

Answer: I understand that these tanks are to be installed with one end of each tank surrounded by or imbedded in the brick wall. J.R.K. asks why does the manufacturer insist upon adding the 2-inch of corkboard insulation around that portion of each tank which lies imbedded in the brick walls?

I do not know what was in the mind of the tank manufacturer, but I suspect that he wanted to protect the tank from the effects of corrosion due to moisture condensation within the walls. Additional waterproofing would have accomplished the same purpose, but it might not last as long as the same waterproofing plus the cork. It seems to me that the tank manufacturer would be justified in using 3 inches of insulation instead of 1½ inches, even though the milk temperature may be 33 or 34 degrees F.—H. G. V.

N.A.P.R.E. Department

Ice Cream Hardening By Tunnel Freezing

Question No. 936: I have been asked to convert a tunnel freezer to ice cream hardening. This will be a continuous chain conveyor. The packages will be size 5½ inches long 3½ inches wide 1½ inches thick, next 4 inches long 3 inches wide 2¼ inches thick; next round cup 3¾ diameter top, 3 inch diameter bottom, 2 inches deep; next round cup 2¾ diameter top, 2¼ diameter bottom, 2 inches deep. The ice cream will enter at 22 deg. F and is required to be hard enough for market when it comes out of tunnel. The tunnel temperature will be —30F and will have air velocity of 1,000 ft. per min. Please advise me how many minutes the packages must stay in the tunnel to harden and if the temperature is reduced to — 40F with 1,500 feet air velocity what will be the difference in freezing time?—T.McG

ANSWER: Answers about freezing time for ice cream packages are difficult to obtain. Most companies consider this information as trade secrets. Answer to Question No. 901 (December issue, page 39) was along this same line, and the best we could do was to give you a formula for the freezing time for ice cream, based upon available heat transfer data. We did not vouch for its reliability. In answering Question No. 936 we are fortunate in submitting data from one of our N.A.P.R.E. brothers from San Francisco, Frank Cordoza. His data is as follows:

5½ × 3½ × 1½ package, -30 F, 1,000 FPM, 32.5 minutes.

Smaller packages will be comparatively less.

By lowering the temperature to minus 40 F and increasing the air velocity to 1,500 FPM, the freezing time is 19.8 minutes.

The industry's experience at the higher air velocity has not been satisfactory. The problem of lubrication, contraction, and defrosting becomes serious. At 1,500 FPM velocity it is doubtful that you could control packages on a conveyor unless some provisions were made to hold them in place. In fact, I have seen poorly wrapped packages stripped of their waxed papers at less velocity.—FRANK CARDOZA.

New Questions

Tower Heat Transfer

Question No. 937: Which renders the greatest heat transfer in a cooling tower, sensible heat or evaporation.—T. M. C.

Sprinklers in Low Temperature

Question No. 938: Fire recently caused severe damage to our cold storage plant. Water, from fire fighting, caused more damage than the fire. In rebuilding, I am faced with high rates unless I install sprinklers. I can't visualize sprinklers functioning in sub-zero sub-freezing temperatures. What types of systems are adaptable to cold storage plants?—R. C. S.

Cooling Water Consumption

—Question No. 939: Is there any rule of thumb for "guesstimating" the number of gallons of cooling water required per ton of refrigeration produced per minute? (a) in shell and tube condenser (b) in cooling towers? —B. C. M.

News Notes and Chapter Activities

New Orleans

LEO J. VIVIEN

THE MEMBERS of Louisiana Chapter No. 2 were the recipients of another fine program arranged by the Educational Chairman, Frank Chase, namely, "Heat pumps and their applications" or "The machine that thinks."

Don Cornell, general manager of the New Orleans Branch of Standard Brass & Manufacturing Company, made this very interesting presentation of the General Electric air to air heat pump at the meeting held in the St. Charles Hotel Wednesday, September 10, 1952.

W. F. "Bill" Sancho, district manager of the General Electric Company, air conditioning division, was introduced by Educational Chairman, Frank Chase. He outlined the program that the General Electric Company followed in developing "the machine that thinks," as he termed it, since 1932. Bill, as he wishes to be called, stated that the engineering staff of General Electric, after burning a great deal of midnight oil, decided that the air to air heat pump was the only solution if the heat pump would be applicable in the major portion of the United States due to the many problems involved in obtaining sufficient water or proper type of soil, making each installation an individual problem.

Mr. Sancho introduced Mr. Cornell who covered the entire operation of the General Electric air to air heat pump using slides so that the members could see what he was talking about. Mr. Cornell told how the heat pump was discovered by Lord Kelvin of England in 1852, but the lack of equipment retarded its development. In the early 1900's the first hermetic machine was developed by Abbey Audiffren of France. The manufacturing rights were bought by General Electric in 1917 due to France's inability to make shipments while they were involved in the first World War. Mr. Cornell said that interest in the heat pump culminated in the first application in 1934 in Salem, N. J. Many installation were made in the 30's and early 40's, sponsored by the electric utilities and manufacturers.

In short, he explained that the heat pump is a mechanical device whereby heat is taken from a low temperature level where for most purposes it is useless like the heat in the air on a cold winter day, and is raised to a temperature at which it is useful like the warm air given off by a furnace. It we cool air at say 20 degrees down to 10 degrees, we take heat from it. The heat pump does this and puts heat into your home. With the use of slides, he covered thoroughly how General Electric developed the air to air heat pump in their own laboratory, field testing some 20 odd, in different parts of the United States under different climatic conditions.

He also pointed out that it was fully automatic, keeping the home or commercial establishment at whatever temperature was set on the thermostat, as it reverses itself from heating to cooling and visa versa automatically as the temperature changes outdoors. It has a co-efficient of performance of three to one though General Electric expects to increase this to five to one.

The low cost of installation is amazing, as it does not require any cooling tower, pump, or any plumbing connections outside of the drain for the condensation. It requires no fuel such as gas or oil supply and by the elimination of a vent it is very appealing to the house owner as the latter is one of the objections he finds to a conventional system.

Mr. Sancho closed General Electric's part of the program by giving some operation cost figures furnished by the Louisiana Power & Light Company, which had installed a special meter in a 3,000 square foot home where a five ton heat pump was installed. The average cost for the first six months, during which time the heat pump operated on both heating and cooling, was $23.60 per month. During the warmer months the outside temperature was 95, the inside temperature 78, and the relative humidity was 50 percent. The owner said that he never knew the temperature outside since he had the heat pump which kept the temperature inside at the correct setting of the thermostat.

The story of "The machine that

thinks" was enthusiastically received by the members of the local chapter. Questions were asked and intelligently answered.

September 24, Mr. Jones of the A. M. Byers Wrought Iron Pipe Company, explained the manufacturing of wrought iron pipe, supplementing his talk with a film, showing the process involved.

We were happy to welcome back Professor Arthur M. Hill, our instructor on Guy King's refrigeration course. Professor Hill spent the entire summer at the General Electric Company's plant, and the course was discontinued until his return. He devotes so much time and effort toward making the course easy for us to understand that we felt the loss of his expert services for a few meetings would be amply repaid upon his return.

Professor Hill completed Chapter 4 at this meeting and the members were enthusiastic in their response. We look forward to their continued interest through the completion of this course. By his able presentation, and renown as an instructor, we were able to interest many new members in the Chapter.

In the final days of the membership contest we are continuing our efforts to secure more members, and hope to give our competitors a run for the Emerson Brandt memorial trophy.

Interest is running high relative to the Dallas Convention, and we will be well represented come November 12.

Los Angeles

FRED HERR

AT THE October 1 meeting of the Los Angeles Chapter, Gene Smith and Charles Chidester, partners in the C & S Equipment Company, Los Angeles, collaborated in the presentation of a talk on "The Automatic Return System."

While the title of the discourse pertained to liquid return systems in general, Mr. Smith, who opened the program, narrowed his comment to automatic liquid return systems and particularly to installations in ammonia plants.

He explained that today the trend is toward higher speed machines and liquid slop-over is becoming an increasingly serious problem. Since this subject is so vital to the operating engineer, the speaker remarked that the question naturally arises as to why the manufacturers do not build machines with more surge capacity. He explained that various factors influence the manufacturers in the production of present day machines, competition and the need to keep up with competitors being a prominent factor. He cited a number of other reasons why the slop-over factor still prevails. His talk of approximately one hour was liberally illustrated with blackboard diagrams. Mr. Smith and Mr. Chidester jointly directed a question-and-answer period following the conclusion of the talk.

President Edgar M. Marrs of the Union Ice Company presided over the business session. He read a letter from National President A. R. Carlson pertaining to the appointment of J. Richard Kelahan of San Francisco Chapter as successor to the late Emerson Brandt, National Secretary. Many Los Angeles members are personally acquainted with Mr. Kelahan and the concensus of opinions was that a suitable choice for the secretaryship had been made.

Three new members were initiated on October 1. Membership Chairman W. R. Burnett reported that, combined with the 19 approved at the September 17 Ham-and-Beans Dinner meeting, the chapter's total of new admissions had reached 59 for the 1952 drive. Mr. Burnett opined that ". . . that figure should be ample to put Los Angeles Chapter back where it belongs — on top."

He explained further: "We have about 20 more prospects which look very favorable for signing before the October 15 deadline. On the whole, it looks like those figures should just about settle the hash of any other aspirants to the 1952 membership drive."

As of October 1 Mr. Burnett reported, Donald Byl of the Union Ice Company was individual campaign leader with 20 new members, Emmett Quinn of Pacific Fruit Express was second with six and Cliff Nordholm of Baker Refrigeration Corporation third with five. In team totals, the California Consumers-Union Ice combine had accounted for 33, and the Independents team for 26.

The Chapter's regularly scheduled meeting for October 15 was cancelled to permit the NAPRE to meet jointly with the local RSES group at the Royal Palms Hotel, Los Angeles, October 22. Mr. Burnett recommended that members mail any new membership applications directly to the secretary before October 15 and they will be processed and included in the totals at a special board meeting held October 15.

New members enrolled at the October 1 and September 17 meetings are: Joe Eckart, Homer Emerson and Cecil Thompson of the Union Ice Company, Bakersfield; Tirso Varges, Charles T. Dress and Floyd F. Byrnes, of California Consumers; Ralph J. Conner, Leo H. Sigler and J. M. Byrnes, Union Ice Company, Los Angeles; R. M. Sommers, Maier Brewing Company; William D. Burroughs II, Jameson Cold Storage Company; H. L. Hughes, Cold Temp Refrigeration; Glen B. Scott, Fluor Corporation; H. E. Lovett, U. S. Electric Motors; Charles W. Woerner, Valleymaid Creameries; William J. Baumer, York Corporation; Neil Boles, American Bitumulus Company; David B. Cole, Robert A. Young Company; Earl R. Ebersole, Harmon Sacking Company; and A. J. Medved, Armstrong Cork Company.

Ed. L. Nelson, chairman of the entertainment committee, was given a vote of thanks for the fine program his committee had arranged for the Ham-and-Beans dinner. Mr. Nelson promised an equally engrossing feature for the December Year-End social evening.

The preliminary class on October 1 was conducted by George Paulick of the California Consumers Corporation. "Condensers—Chapter No. 7" in Guy King's book was discussed.

An S. R. O. crowd of 155 members and guests attended the Ham-and-Beans dinner on the night of September 17. The main dining room of the Terminal Club was required to accommodate the large attendance. The festivities began with a social hour at 6:00 p.m., during which V. A. Stubblefield of the Pacific Fruit Express and Frank G. Muzzy of Skazol Products presided as official dispensers of the collations. Some barbership quartetting, distingushed by volume rather than harmonious synchronization, enlivened this hour, as groups of members and guests draped themselves about the piano and rocked the rafters with nostalgic tunes.

Ham and beans were served cafeteria style beginning at 7:00 p.m. That menu was quite satisfying and seemed to develop in the partakers an inclination to sit comfortably in their chairs and light up cigars, so that a suggestion broadcast by Secretary Donald Byl over the loudspeaker that "Everybody carry his own dishes to the kitchen" produced no significant results. The dishes eventually got to the kitchen after Byl, Stubblefield and several others doubled as bus boys. The professional technique they displayed in stacking plates and saucers on the wheeled carts drew a generous round of applause from the sitters, and the suggestion that Byl and Stubblefield be permanently assigned to the Dirty Dishes Committee.

Frank R. Elliot (center) receives from W. R. Burnett, chairman Membership Committee, a glass of "root beer" as reward for bringing new member at Ham-and-Beans dinner meeting. Members who brought in one or more new members during the summer were permitted to visit Ray's Bar.

An unscheduled break in the evening's program was taken after dinner to permit the crowd to view the Rocky Graziano-Chuck Davies prize fight on the Terminal Club television. The business session was called to order immediately after the conclusion of the fight.

The Ham-and-Beans Dinner usually brings out some members whose business affairs prevent regular attendance. Noticed among those present were Tom Shervin of Shervin Electric Company, E. J. Buller of Hollywood Roosevelt Hotel, and T. J. Peukert of Associated Refrigeration Engineers.

Twelve of the 27 men who have served the chapter of president since its founding were present: H. N. Royden (1928), E. T. Quinn (1933), Frank R. Elliot (1936), W. R. Burnett (1940), Regis Gubser (1942), Thomas Shervin (1944), P. J. Buller (1945), Ralph M. Moore (1947), Don M. Byl, (1948), Rudi Kettler (1949), Dale Rycraft (1950), and Edgar M. Marrs (1952).

Membership Chairman W. R. Burnett enthroned himself behind a beautifully designed speaker's dias which bore the sign "Ray's Bar" to present his report on the summer's activity in obtaining new members.

An attraction popular as ever was the distribution of some three dozen door prizes ranging from baked hams, cases of tuna and lubricating oil to Guy King refrigeration book. Frank Elliot of the Union Ice Company popped up as the first winner and lugged home a baked ham donated by the Western Salt Company. Herbert Royden of the Royden Ice Company received a case of lube oil, while Dale Rycraft of the Peterson Manufacturing Company and Regis Gubser of California Consumers will have their home refrigerators well stocked with tuna for several weeks.

The main entertainment program was presented immediately after the conclusion of the business session. W. R. Burnett served as master-of-ceremonies in lieu of Ed L. Nelson, committee chairman (Nelson was on vacation), and introduced the various performers with professional aplomb. Presented was an excellent variety of piano renditions and dance numbers, the latter featuring both semi-classical ballet and more informal versions of time-honored interpretations of the terpischorean art.

The chapter's next general meeting is scheduled for November 5 at which a safety program will be presented by William Osborn of the California Consumers Corporation.

San Francisco

FRANK CORDOZA AND CHAS. T. STEWART

A REGULAR membership meeting was held on September 24th with a preliminary class conducted by Prof. Don Bryant, San Francisco City College. Supplementing Don's lecture from the Guy King course, a program was presented by G. E. Green, a well known San Francisco Electrical Engineer. Mr. Green's firm, the General Electric Company presented a colored movie, "Motors, Their Fundamentals and Applications."

Another guest at this meeting was Mr. J. Harris of the Dallas, Texas Chapter NAPRE. Mr. Harris explained the extensive plans and preparations in store for the 1952 NAPRE Convention in Dallas.

California Chapter No. 1 announces with regret the passing of the mother of our past President, Andy Hope.

One of our newest and most enthusiastic members is Lou Brooks. He has volunteered for the Membership Committee. We are sure Lou will get results. Let's all give him our help. If you know a prospective member, give Lou his name and address. Lou is the most recent addition to the Carrier Corporation staff in San Francisco.

The Educational committee of San Francisco chapter meets on Wednesday, October 1. A lot of good ideas are forthcoming and are to be announced at the next meeting.

A lot of past President Bill Orton's buddies have wondered what became of him as they have not seen Bill around lately. Perhaps the following little bit of doggrel will explain:

What became of Bill Orton?
We hear he's gone a courtin'
When a wife he has won,
And is no longer free
He will attend meetings
At the good old N.A.P.R.E.

At the meeting October 8, Don Bryant continued his lesson on refrigerant piping and accessories. There was no guest speaker at this meeting but the members present participated in a question box session. We started with the new questions in the October ICE AND REFRIGERATION, page 41—questions 934, 935 and 936. We wanted to see if we are as good as the home office in working out answers. November issue will tell.

We had to cut the business session at the last meeting due to the late hour and interesting discussion, but will have a couple of important decisions to make at the next meeting, including a consideration of delegates to the National Convention at Dallas, November 12, 13, and 14.

St. Louis

KEN HOLADAY

ST. LOUIS Chapter stepped off into the 1952 fall program with a good crowd at David Rankin School of Mechanical Trades, Monday evening, September 15. Instructor John Dabbs covered the subject of compressors in his usual effective fashion, following the new NAPRE text and supplemented by his own comments and class quiz. He illustrated the discussion with a cut-away working model of a small compressor.

There was a round table discussion of lubrication problems, particularly causes and remedies for high oil consumption.

The schedule for future class meetings was announced as 7:30-9:30 p.m. on the first Monday, and 7:00-9:00 p.m. on the third Monday of each month. The regular chapter meeting is to follow the class meeting on the third Monday.

President Charles Wunderlich announced that Bill Wright is to serve as Chairman of the picnic committee, and the notices on final arrangements for this October function are to go out soon.

Reports by Secretary Stan Tatalovich and Treasurer E. W. Acey indicated that the chapter is solvent, but cannot continue to carry on the present effective program at the current cost of $7.00 for annual dues. Unanimous approval was given to increasing the dues to the $8.00 limit established by the National Association a couple of years ago.

Memphis

CHAS. A. CONLEY

AT THE meeting September 17 H. L. Todd talked on Pages 166 through 173 of the King Course. This subject covered automatic controls and expansion valves. He used the blackboard to explain his talk with making sketches of various applications of equipment. There was a good attendance at the meeting.

The leaves are falling—the Fair is over—Football season is here—Politics is getting rough. Less than 45 days and the Convention will start at Dallas, Texas—just a good walking distance from Memphis. It's hoped many from this Chapter have their plans ready to attend the Convention.

On Wednesday, October 1 at the Hotel Chisco there was a business meeting and an educational meeting. H. L. Todd lectured on Page 174 through Page 178. This subject covered controls and valves.

The meeting Wednesday, October 15 was a double barrelled meeting. Mr. Todd lectured on Page 179 through 184. This subject covered Lubrication, a slippery subject, but a good one.

The second barrel of the meeting Miss T. R. Boland of the Modern Talking Picture Service showed two very interested and worth while talking motion pictures; one picture "Service Unseen," by Carrier Corporation, pioneers in Air Conditioning; the other picture, "The Dupont Story." This picture gave the history of the Duponts and what they have done for "Better Things for Better Living."

Mr. Todd talked on pages 174 to page 178 of the King course. This subject covered various types of controls for various applications of refrigeration for various temperatures, also safety valves and other types of safety equipment. He used the blackboard again to put over his talk, making sketches of various hook up of coils.

Frank Paul Kish, Asst. Engr., Hotel Peabody, was elected to membership. The 1952 Data book was passed out to those present.

Donald L. Glaspie a member of the Chapter who has been a sales engineer for the Shelby-Skipwith Company, York Corp., agent in Memphis, is taking over a York Agency at Springfield, Mo.

Seattle

JIM BENNETT

THE OCTOBER meeting was held Thursday, October 23, at the Central Y.M.C.A., this change in date from the second Thursday of the month being necessitated because our instructor, Frank Gellert, had a conflicting meeting scheduled. We hope for a big turnout at the next meeting to show Frank that we really appreciate his efforts.

As he pointed out at this meeting, we have passed the theoretical part and now that we are getting into the more practical side, the class will enter into the discussion to a greater extent, with Frank acting more as a moderator; so he asks all to read pages 103 to 137 on compressors before the meeting and we will discuss the following specific topics: (1) Suction and discharge valves, (2) Piston Rings, (3) Shaft Seals and Stuffing Boxes, (4) Jacket Cooling, (5) Capacity Control and Unloaders, (6) Rotary Compressors.

The 1952 Data Books have arrived and will be passed out to the membership at the next meeting and mailed to the out of town members.

Remember the National Membership contest ends October 16, so if you have a prospect for membership lined up, rush that application to your secretary so we will receive credit before the deadline.

Two new members were inducted at the last meeting. May we introduce Joseph H. Pierce, chief engineer at the Smith Tower; and Don Selg, an operating engineer at the Washington Co-op Farmers Association. At the October meeting we introduced new members Charles H. Cothran of the American Marietta Co., sent in by Al Zemko; and James H. Vosburgh, assistant superintendent in charge of production for Broder Canning Co. Ltd. of Lethbridge, Alberta, Canada. Jim Vosburgh's application was sent in by Lloyd Graves of N.W. Baker Ice Machine Co.

Colton

H. O. BONTER

THE CHAPTER members, friends and wives attended a picnic lunch the evening of September 10 at Devil's Canyon, San Bernardino. A very enjoyable time was had by all. After reducing the heavy load on the tables, the group stood round the camp fire and sang to the music by C. H. Purkiss on the mouth harp.

October 8 the members and friends gathered at the Santa Fe ice plant lunchroom for a meeting and lunch. The speaker of the evening was H. W. Hawkins, of the Hawkins Chemical Co., Los Angeles, Calif. H. W. Ward of the same company attended the meeting with Mr. Hawkins. Mr. Hawkins' subject was the treatment of water for domestic use, for the making of clear ice, the treatment for condensers, also the treatment of water for boilers.

The members voted to donate $10.00 toward the Emerson Brandt memorial.

Arnold R. Miller, service manager for the Tri-City Climate Control, Riverside, Calif., was accepted as a new member.

Chicago

BERT MCKENNA

ON OCTOBER 7, Chicago Chapter held its first inspection trip of the year. The Central Cold Storage Company plant at 350 North Dearborn Street was visited. Preliminary meeting and class instruction was held at 7:00 p.m. in the inspection room on the first floor of the plant. Eugene Rytlewski instructed on cooling towers and condensers.

Following this session a tour of the shell egg cold storeg rooms was made. L. J. Rudolph, superintendent of operations of this plant, talked briefly to the visitors on the preparation of a cold storage room for shell egg storage. "The room should be emptied of all other products and then a thorough job of housecleaning performed. The housecleaning consists of brushing down with a stiff brush, or using a vacuum cleaner on the walls and ceiling, to rid the room of any odor-carrying dust, after which the floor sheuld be scrubbed with a strong detergent to eradicate any foreign matter from the floor.

"It cannot be stressed too strongly the importance of cleanliness, as dirt does hold odors and when the dirt is removed the odors are removed. Also, the refrigerating coils should be cleaned and the snow taken out of the room; also the dunnage which is used in piling must be clean and odorless. After the room has been cleaned and is free from odors, a coat of whitewash applied to the walls and ceiling, which is a bacteria killing agent, will complete the job and the room is ready for the storage of shell eggs."

Final phase of the inspection trip was the tour of the refrigeration machinery room conducted by the chief engineer Bert McKenna. Following the tours a hot luncheon and ample liquid refreshments were served.

The meeting of October 21 was held in the auditorium of the Engineers Club. Condensers, cooling towers and water treatment instruction classes were conducted by Eugene Rytlewski.

N.A.P.R.E. Member Starts Another Business

ALEX JOHNSTON, long time mem- of the San Francisco chapter N.A.P.R.E. announces the purchase of the Anchor Brass Works in San Francisco. Alex, at present, owns and operates the Pacific Marine Refrigeration Company, a well known waterfront refrigeration service organization.

The Anchor Brass Works has been operated in San Francisco for 30 years. All types of machine work and the manufacture of brass goods has been the primary function of the Works. In addition, the shop is completely equipped for repairing and adjusting of lubricators, injectors, revolution-counters, all makes of valves, and the setting and testing of hydraulic, steam, atmospheric, vacuum, pop, and relief valves and gauges.

NAPRE Department

Author Commends Pocket Data Book

DO you, as members of the NAPRE, know the value of your NAPRE pocket data book?

In a recent article by F. P. Bang in the Refrigeration Journal, an official organ of the Australian Institute of Refrigeration, entitled "Ammonia Containers—Types I Have Found Efficient," the author refers to a table on the quantity of pipe required for condensers per ton of refrigeration with water at certain temperatures. Taking 1¼ in. pipe as an example (which is generally used), the quantity required is 76 ft. to the ton of refrigeration, with the condensing water at 75F, with corresponding quantities with bigger and smaller pipe. In books of more recent times, the same table appears, so that, over the years, there has not been much alteration in this regard, he says.

The above reference is to the table on page 100 of your pocket data book. Do you use yours? Much of the information contained can be used for your every day calculations with very few changes. If you have lost your pocket data book, ask your Secretary about replacing it, or write National headquarters if a member at large.

C. A. Richardson Retires Refrigerator Car Expert

NAPRE member C. A. Richardson, long associated with the railroad industry of the U. S., has retired. Born August 18, 1885, in Zearing, Iowa, Brother Richardson graduated from Cornell College, Mt. Vernon, Iowa, with a degree in Civil Engineering. After a few years of experience on railroad location, reservoir, irrigation and water system construction, he joined the engineering staff of Pacific Fruit Express Co. He remained with this firm for 31 years. From testing as his first assignment, Mr. Richardson went to Superintendent of car heater service, and was superintendent of refrigeration at the time of his transfer.

In February, 1946, he came to Chicago with the Mechanical Division of the A.A.R. as chief engineer of the Refrigerator Car Research Bureau. He sums up his engineering lifetime as follows: "Research and investigation on construction and insulation of railroad refrigerator cars, and field test trips for developing data on the rail transportation of perishable freight." Brother Richardson has been a member of NAPRE since August 13, 1924.

ENGINE ROOM POINTERS —

More and More Speed

MOST readers are doubtless old enough to remember the old Corliss engines as they majestically drove the slow-moving ammonia compressors. This writer doubts whether refrigeration engineers of today derive as much "kick" out of modern high speed refrigerating machinery as did those who drove the former type who were proud of knowing how to take indicator cards, who loved Corliss engine trouble, packing trouble, belt trouble, governor trouble, and so on. Today there isn't nearly as much trouble. Overalls don't even get greasy.

Today it's "speed". Not so long ago the vice-president of a prominent automobile manufacturing concern, in writing about the remarkable record of one of his cars, said that the "great record of 30,000 miles in 26,326 consecutive minutes has never been equaled." He said, "Nothing else (except comets, meteors, and other heavenly bodies) ever traveled so far so fast."

This writer doubted the above statement at the time because he knew that some electric motors and most steam turbines travel at what is commonly called a "terrific speed". Not knowing the exact speeds a number of manufacturers of steam turbines were questioned and information was received which is doubtless of unusual interest to other refrigerating engineers. One large manufacturer, for example, wrote: "The maximum top speed we use in ordinary practice is 800 ft. per second."

Multiply 800 by 60 and you get 48,000 ft. per minute. Divide that by 5,280 and you will get 9.1 as the number of miles per minute made by a turbine blade in ordinary practice. The 30,000 miles made by the above automobile in 26,326 minutes was only 1.14 miles per minute as compared with this 9.1 miles per minute by the turbine blade. In other words the turbine blade travels eight times as fast as the automobile travels, continuously, yet the vice-president said, "Nothing but comets, meteors, and other heavenly bodies ever traveled so far so fast."

Another concern that is prominent the world over—a maker of large steam turbines—wrote as follows: "We have in commercial service steam turbine buckets operating at a normal lineal speed of 865 ft per second at the pitch diameter, and 1140 feet per second at the tip." That is considerably greater than 800 ft. per second. It is equal to very nearly 13 miles per minute.

And still another manufacturer said, "Turbines are built with wheels having a lineal velocity of 1200 ft per second. These are commercial machines and, therefore, may be called upon to run continuously." This is equal to about 13.6 miles per minute.

In writing about a competing machine another manufacturer said that their "small high speed machines ordinarily operate around 1200 ft a second and have been known to reach a velocity of 1400 ft a second with buckets which have been tapered." This last manufacturer furnished the information that: "European practice is approximately 1000 ft a second at operating speed."

As the reader will note, the highest speed reported was 1400 ft per second, which is equal to 15.9 miles per minute. It is an interesting fact that even this highest speed is not sufficent to "keep up with the sun" in traveling around the earth at the equator. 15.9 miles per minute is equal to 954 miles per hour or in round numbers 23,000 miles in 24 hours.

To travel around the earth in 24 hours at its equator, a distance of 25,000 miles, demands a speed of 17.4 miles per minute. To accomplish this will require a turbine blade speed or a speed of anything else of 1530 ft per second. According to the above information a continuous speed of 1530 ft per second has not yet been attained. But, of course, we are traveling very rapidly these days. By the time this gets into print the writer may be wrong.

Bullet velocities of a mile a second have been attained, but bullets, to be sure, do not move continuously. To make a bullet leave the earth, never to return, a computed velocity of seven miles per second would be required—in a vacuum. That is, there must be no atmospheric resistance. The possibility of ever attaining such a speed is remote, but this writer won't say that it "can't be done". He mistakenly said, a number of years ago, that he didn't believe the atom would ever be harnessed.

Gases travel at speeds much higher than turbine blades, and higher even than bullets. But the vice-president of the above company very likely had reference to solid bodies and not to anything fluid or gaseous. Besides, he made it clear that he meant "continuous performance".

Also, as every reader doubtless knows, there has in recent years been a very remarkable advance in speed by airplanes, rockets, and so on. Airplanes have equaled the speed of sound in power dives and even in straight flying, with human beings in the planes. Occupants of those planes have therefore traveled faster than any of the other humans. Rockets travel considerably faster than the speed of sound, but thus far no human has been carried by a rocket.

Pointers on the Care of Idle Boilers

NO doubt every reader knows that corrosion saps the life of boilers. The time to protect against this risk is when boilers are idle. That is the time to give them a careful inspection and take steps for restoring them to the clean, dry condition which resists corrosion, increases their efficiency and lengthens their life. The ultimate cost of any boiler is directly proportional to the length of its active life.

An important point to bear in mind is that it is the contact of moisture with metals which causes the corrosion, and that carbon dioxide gas accelerates this action. An idle boiler which contains water, or an empty one which is not dry, provides the situation in which the iron is likely to go into solution, resulting in the formation of pits and scabs. Even moisture in the atmosphere is sufficient to start this corrosion. Then rust proceeds to collect on plates, headers, and tubes. The best time to clean boilers is when they are warm so that all moisture may be evaporated by natural circulation of air.

When it is known that a given boiler will be idle for a long time, a prompt cleaning with a good wire brush, and removal of soot, ashes, and other dirt, are desirable. After a thorough cleaning is completed, it is wise to place a little unslacked lime inside to absorb any remaining moisture. Access doors must be closed, and if there is much wet air, fire-pots or other methods of heat application will help to keep the boilers dry. Application of a good non-evaporative oil is protection against corrosion.—F.W.S.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D.C.

Executive Vice-president
WM. DALTON, WASHINGTON, D.C.

Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.

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RICHARD F. CURRY, WASHINGTON, D.C.

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A. B. EFROYMSON, CLEVELAND, OHIO

Vice-president
R. M. CONNOR, CHICAGO, ILL.

Treasurer
CHAS. B. HART, TACOMA, WASH.

THIS MONTH IN BRIEF

A panel discussion by representatives of the refrigerated warehousing and poultry industries was held in Chicago, on reducing costs and time lost in storing, moving, and warehousing poultry, butter, cheese and eggs.

A new refrigerated warehouse has been opened at Omaha, Neb. by the United States Cold Storage Corp. Formal opening was held September 25, at which officers of the company were on hand to welcome visitors.

Materials handling is an important phase of the service provided by wholesale frozen food distribution plants—a summary of information compiled from a Marketing Research report issued by the United States Department of Agriculture.

Refrigerated storage of wet cell (auto) batteries is encouraged by a battery manufacturer, following research.

Reducing Costs and Time Lost in Moving Shipments of Poultry — Panel Discussion

A SHORT panel discussion by representatives of the warehousing and poultry industries, held in connection with the annual convention of the National Poultry, Butter and Egg Association, was held at the Sherman Hotel, Chicago, November 6. The subject covered was that of reducing costs and time lost in storing, moving and warehousing poultry, butter, cheese and eggs.

Leading the discussion was R. M. O'Connor, Chicago. Representing the warehousing industry were Vallee Appel, Chicago; Phillip Kuehn, Milwaukee, and Jack Byrnes, New York. Representing the poultry industry were Fred Dearmin, Odon, Ind.; H. W. McGrath, Chicago; and Donald Norbeck, Chicago.

Minimum Handling Charge

Answering a question as to minimum charges now being made on handling lots of poultry products, it was pointed out by one of the warehousemen that increased wages make the minimum charge of fifty cents now assessed necessary. While it is sometimes called a nuisance charge this warehouse collected a total of $33,000 for such service last year, which might well mean the difference between a profitable and an unprofitable operation. It has also reduced deliveries by about one-third. This warehouseman reported that in 1951 his company made an average of 250 deliveries a day. If a handling charge were applied only to small lots, it was suggested that this would lead to endless arguments as to just where the line should be drawn.

Generally, it was suggested, this charge is fair to both parties and in its absence it probably would be necessary to increase the storage rate. The warehouse provides two classes of service, storage and handling. It is from storage that they expect to make profits and the charge for handling is assessed almost purely to avoid losses.

Rail and Truck Shipments

Changing conditions brought about by decreased shipments by rail and increases in truck shipments came in for considerable discussion. The time element in serving trucks, it was pointed out, is important. While rail shipments can wait over a period of several hours, trucks should be loaded or unloaded as promptly as possible. Usually priority is given to local trucks, but this is not always possible.

There seems to be two peaks per day of truck arrivals, in the early forenoon and late afternoon and during those rush periods it is not always possible to service them promptly. It was suggested that if some could arrange to arrive between 10:00 A.M. and 3:00 P.M. it would help to relieve congestion. Also it was suggested that if trucking concerns or the driver would arrange a definite time, and then be there at that time, it would be a big help. The limited number of employees available to load or unload trucks makes it impossible to serve more than a few at one time. Proper loading and a properly prepared manifest will save much time and the manifest should show specific weights.

It was pointed out that any improvement in this situation must come from the truck operators and drivers because it is difficult for the warehousemen to do anything about it. Increasing crews would mean added expense, which would have to be passed on to customers. What is needed is close coordination and cooperation between the two industries.

Marking Boxes

Another point brought up was markings on boxes. These stencils do not appear to be standard and some inconsistencies have been noted. What is needed is for the weight and other information to be printed in uniform type and style. Most of the

larger shippers, it was stated, comply with this requirement, but many of the smaller shippers do not. Proper marking, it was explained, saves time and expense because it will enable trucks to be unloaded without loss of time.

Ice packed poultry is regarded favorably by poultry packers but they have met with some difficulties in storage. When storage is required they try to move it promptly but if service is delayed the ice will start to thaw and this creates a dripping problem, with ice on freezer floors which the warehousemen do not like. This product, the packers say, should get into the freezer without delay and most delays come from the warehouseman not being able to move it in promptly. The warehousemen acknowledge an obligation to serve customers, and are inclined to the opinion that a better service on this particular product could be provided.

Francis X. Brown Replaces R. F. Curry at NARW

THE APPOINTMENT of Francis X. Brown, Jr., as a special assistant for the National Association of Refrigerated Warehouses, has been announced. He replaces R. F. Curry recently resigned to enter the employ of the National Coffee Association, New York City. Frank

Francis X. Brown

brings to the Association a fine concept of public relations and all its attendant segments of activities. Twenty-seven years of age, a graduate of the University of Maryland, most of Frank's adult life has been spent with the armed forces in the pacific and elsewhere. His character, and enthusiasm will contribute greatly to the continued and increasing success of the Association's efforts in behalf of a great industry.

Warehousemen Oppose State Warehouse Act

BULLETIN: At at meeting of the Legislative Drafting Committee of the Council of State Governments held October 16, action was deferred on the proposed State Warehouse Act for a year and a subcommittee was appointed to review the subject.

THE National Association of Refrigerated Warehouses went on record as being strongly opposed to a proposed "State Warehouse Act," in a resolution adopted by its Executive Committee in Cleveland, October 14.

In the resolution, the members of the Executive Committee stated that "this proposed State Warehouse Act indicates an attempt to secure regimentation, control and supervision through state action and infers ultimate absorption by the federal government in usurpation of state's rights."

The Act, which in effect would classify all warehouses as public utilities and impose upon them subsequent restrictions and regulations, was sponsored by USDA and presented to the Legislative Drafting Committee of the Council of State Governments at its meeting in Washington, October 16-17, for approval by individual States.

Warehousemen across the nation have voiced spontaneous and vehement opposition to this Act, and their attitude is reflected in the Executive Committee's action. NARW's Great Lakes Chapter adopted a similar resolution at its meeting October 15.

The text of the Executive Committee's resolution is as follows:

Resolution

WHEREAS, the Department of Agriculture has prepared and submitted via the Office of the Attorney General or the United States to the Council of State Governments, a proposed "State Warehouse Act," which has been referred to the legislative Drafting Committee; and

WHEREAS, this proposed "State Warehouse Act" is scheduled to be considered at a meeting of the Council's Legislative Drafting Committee in Washington, D. C., on October 16-17, 1951; and

WHEREAS, this proposed "State Warehouse Act" indicates an attempt to secure regimentation, control and supervision through State action and infers ultimate absorption by the Federal Government in usurpation of State's Rights; and

WHEREAS, the historical practices and actions of the Commercial Warehouse Industry throughout the years does not in any manner indicate the necessity for such control and supervision, or need for any of the provisions of this proposed "State Warehouse Act;" and

WHEREAS, the Commercial Warehouse Industry operates under the provisions of the Uniform Warehouse Receipts Act, which has been adopted by every State in the Union, and passed by Congress for the District of Columbia; and in addition is operative in Alaska, the Philippine Islands, and Puerto Rico; and

WHEREAS, present commercial warehouse ethical business procedures have adequately protected and continue to protect the public interest;

Therefore, Be It Resolved:

That the Executive Committee of the National Association of Refrigerated Warehouses, in meeting assembled in Cleveland, Ohio, on October 14th, 1952, record its opposition to the adoption of the proposed "State Warehouse Act" for submission to State Governments; and be it further resolved:

That Mr. R. M. Conners, Vice President of the National Association of Refrigerated Warehouses is hereby authorized to present this resolution before the Legislative Drafting Committee at its meeting in Washington, D. C., and

That a copy of this resolution be forwarded to each member of the Legislative Drafting Committee of the Council of State Governments.

North Atlantic Chapter

AN OUTSTANDING meeting of North Atlantic Chapter, National Association of Refrigerated Warehouses was held at Lake Placid, New York, September 18 and 19 when almost a hundred refrigerated warehousemen and their wives from the East Coast area joined together for the discussion of industry problems and some relaxation. Special guests were several warehousemen from Canada and a special paper was read by W. Dennis Day of Toronto. The sessions on Friday were devoted mostly to panels and round table discussions on the industry's major problems.

Correction

THE illustration on page 13 of the September ICE AND REFRIGERATION was wrongly captioned. It should have read: "Auto battery electric stacker with built-in charger." This is a platform type stacker intended for lifting relatively light loads to tailgates and for similar lifting operations.

United States Cold Storage Opens Omaha Plant

New refrigerated warehouse of the United States Cold Storage Corporation, Omaha, Neb. The one-story building covers seven acres and has 148,000 square feet of floor space.

FORMAL opening of the new refrigerated warehouse of the United States Cold Storage Corporation at Omaha, Nebr., was held September 25. Those attending the opening of this newest link in the company's chain saw a modern designed building with a large capacity on just one floor combined with the latest methods and equipment. Over 500 members of the trade attended the formal opening.

Officers Present

Officers and directors of the company were on hand to show visitors through the new plant from 2 until 8 pm. They included G. D. Allman, chairman of the board; E. M. Dodds, president; C. E. Olson, vice president and manager, Omaha plant; R. N. Conner, vice president and manager of the Chicago plant; R. T. Mackenzie, vice president and manager of Dallas plant; E. E. Seymour, vice president and manager of Detroit plant; H. L. Trask, vice president and manager of Kansas City plant; R. L. Smith, assistant treasurer, Kansas City; Stanley Graner, assistant treasurer, Chicago; Adrian Woltkamp, assistant treasurer, Omaha; Al Rosie, assistant manager, Detroit; W. J. Fink, Kansas City; Jack Reynolds, Detroit and Jerry Tieman, Chicago.

Also on hand were W. F. Leimert and Noel Russell, president and vice president, respectively, of the Tranin Egg Products, Kansas City, a subsidiary of the United States Cold Storage Corporation, and Guy Robertson, editor of the company's publication, the U. S. Sno-man.

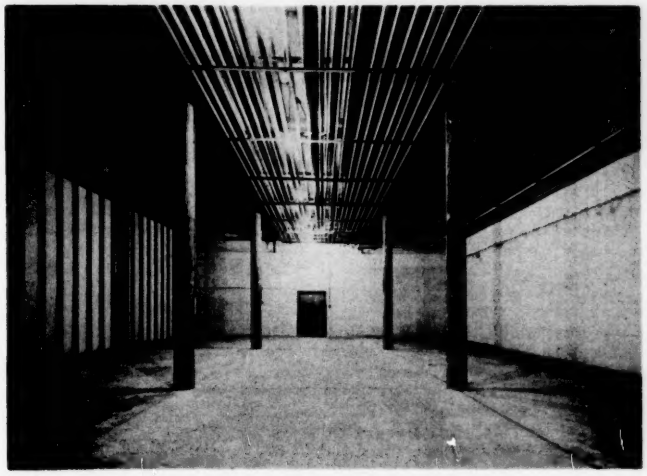
Carl Olson, vice president, is the manager of the new plant. Mr. Olson, formerly assistant manager of the Detroit plant, has been associated with the United States Cold Storage Corporation for more than 20 years. This long experience and resulting knowledge of the cold storage industry will be invaluable to the new project. In accordance with company policy, all key positions in Omaha were filled from the staffs of the other plants.

Holding Capacity

The new Omaha plant has a holding capacity of 25 million pounds of perishable foods and provides temperatures for frozen fruits and vegetables, cheese and nuts and all other foods for which service of this type is desired.

The plant covers seven acres of ground. The building, all of one-story construction, totals 148,000 square feet, of which 104,000 square feet are refrigerated, 76,500 square feet freezer and the remainder convertible freezer or cooler.

Major rail and truck lines converge at Omaha, and the new plant is well equipped to handle all classes of shipments. Free switching is offered from all trunk lines through the South Omaha Terminal Railway



One of the freezer rooms in new Omaha plant of United States Cold Storage Corp.

on which the plant is located. Its ready accessibility to all main highways facilitates the movement of truck shipments to and from the new plant.

The enclosed and refrigerated car dock which protects products from the elements and excessive temperatures during loading and unloading, accommodates 11 freight cars. An enclosed truck dock provides doors for spotting 54 trucks at one time. From each dock 11 doors give access to the refrigerated area.

The plant is completely equipped with the latest materials handling equipment. Foodstuffs are moved from cars or trucks to the storage rooms in ton units. Pallet loads of this size are tiered in the high-ceilinged rooms with telescoping fork trucks. Other handling equipment designed for the various specific jobs work together to produce fast and continuous movement of all incoming and out-going products.

The storage rooms are refrigerated by brine coils in both freezers and coolers. The refrigeration equipment provides a freezing capacity of 300,000 pounds a day. Of this capacity, 100,000 pounds per day is in six blast freezers.

Refrigeration Equipment

All refrigeration units are installed in multiple to assure continuity of operation and to provide flexible maintenance of suitable conditions in the various sections of the warehouse.

The ammonia system for cooling brine and blast freezer coils consists of three rotary booster compressors, four multi-cylinder high stake compressors with inter-coolers, condensers, and other auxiliary equipment. Three brine pumps circulate brine through brine coolers and the two balanced systems supplying the room coils. The two brine systems may be cross-connected.

Complete coverage of the storage areas and blast freezers by 68 thermocouples makes temperatures continuously available to operating personnel through a Honeywell-Brown electronic precision indicator. This is supplemented by frequent readings of thermometers located throughout the warehouse.

Provision has been made for air purification, humidity control, and maintaining of other conditions best suited to the protection of products in storage.

Fast Service

Office equipment and routines are set up to provide a high standard of accurate records and speedy transmittal to customers. Through coverage by a telephone system for both outside calls and inter-communication a loud speaker paging system and pneumatic tubes from the general office to warehouse offices make easy the rapid transmission of instructions, orders and paperwork.

Air conditioned office space is available for the convenience of those desiring a headquarters close to their goods in storage, as is also space for processing foods on their way to or from storage.

Directors Meet

Directors of the company who were there to attend the opening held an afternoon meeting preceding the formal opening. Following the meeting they were entertained by a large group of Omaha civic and industrial leaders at a dinner at the Omaha Athletic Club.

Directors in attendance were G. D. Allman, Edward F. Blettner, jr., E. M. Dodds, P. R. Gates, Huntington B. Henry, E. E. Hesse, Sidney C. Murray, Grier D. Patterson and L. D. Schreiber.

Tax Amortization

A CERTIFICATE of Necessity for tax amortization of new refrigerated storage facilities has been approved by the Defense Production Administration for the Santa Clara Cold Storage & Freezer Co., Santa Clara, Calif. Amount certified was $405,356, of which 55 per cent was allowed.

Storage Tests With Florida Grapefruit

AS A PART of investigations on the storage of citrus fruits conducted by the Bureau of Plant Industry, U. S. Dept. of Agriculture and the Refrigeration Research Foundation, storage studies were conducted at Orlando, Fla. and New York, N. Y. Packinghouse treatments consisted of washing, waxing, polishing, and packing of fruit in bruce boxes with phenodor liners. At Orlando the storage temperatures were 32 and 50 F while at New York they were 32, 38, 45, 50, and 55 F and 85 to 90 percent relative humidity. The test boxes were shipped to New York along with commercial shipments under standard refrigeration. The storage tests were designed to ascertain the keeping quality of fruit picked in April and about a month later, in May.

Each of the test lots at Orlando consisted of 15 packed boxes, while at New York where the storage facilities were greater each test lot consisted of 33 boxes. The potential keeping quality was determined by a seven-day holding test at 70 F. The withdrawals from storage were made after four and eight weeks and each subsample consisted of three box lots.

The fruit used in these tests proved to be extremely subject to decay and no clear cut conclusions can be made regarding the differences in storage behavior of April vs. May-pick or between fruits of the Duncan and Marsh varieties. The grapefruits when removed from storage held up fairly well for three days at 70 F, but developed considerable decay by seven days. Where pitting occurred it was worse at 38 F than at lower or higher temperatures. Where pitting was not important at inspections made at the end of a four weeks' storage period, best results were secured from storage at 32 or 38 F, however, where pitting occurred the best over all results were at 45 or 50 F storage.

Storage for eight weeks was completely unsuccessful because of the serious amount of pitting at 32 and 38 F and the prevalence of decay at all storage temperatures. The results showed that decay developed very rapidly during the holding test period of 70 F following storage.

Records were taken on twelve commercial carlots of grapefruit that were stored either at Newark, N. J. or Providence, R. I. Storage temperatures were approximately 32 F, and the storage period averaged about four weeks. The results indicate that because of low prices the commercial storage was unsuccessful. The condition of the fruit in five cars at the time of removal from storage was rated as fair to poor to very poor, chiefly because of the prevalence of decay. However, the fruit in four of the five cars was found to be in poor or very poor condition at the time it entered storage.

These findings should suggest the importance of careful handling in the packinghouse and in refrigerated transit, and storing only strong fruit of high quality. These suggestions should be followed even though the sales price is low as was the situation during 1951

Warehousing For Frozen Foods

An Important phase of the service provided by wholesale frozen food distribution plants is that of materials handling, and this depends primarily on properly designed facilities.

FROZEN food wholesalers whose operations are efficient from the viewpoint of returns per dollar of capital invested, usually do an efficient job of handling the materials that move through their plants. Actually, frozen food wholesalers are materials handlers since they do not change the form of the product received or add anything to its intrinsic value. In other words, the items handled are not processed or repacked while in the wholesaler's possession. From the viewpoint of plant operations, the frozen food wholesaler receives, stores, assembles orders, loads, out delivery trucks, and otherwise provides the protective services required in maintaining the quality of the product.

Efficient materials-handling operations cannot, as a rule, be performed in improperly designed facilities. In fact, facilities should be designed and constructed so as to permit the best use of equipment, depending on the wholesaler's scale of operation. Altogether too many facilities for the wholesale distribution of farm and food products have been constructed without taking into account the costs of performing necessary handling in them. In planning a wholesale distribution plant frozen food wholesalers should not overlook the specific facility requirements for the types of handling equipment they will use in the facility.

To achieve maximum efficiency in materials-handling operations, the equipment must be used in an environment which permits the best possible methods with the equipment selected to be employed, which means that platforms, floors, doorways, column spacing, ceiling heights, aisles, and other features must be properly designed for methods and equipment to be used. The facilities should be arranged to minimize the distances merchandise must be transported within the plant. The use of purely manual handling methods should be kept to a minimum. The building should preferably be of single story design since with present-day equipment handling on a horizontal or plane surface is more economical than is the moving of products between floors.

This article is a summary of information on materials handling in wholesale frozen food distribution plants, extracted from Marketing Research Report No. 18, "Planning a Wholesale Frozen Food Distribution Plant." issued by the Production and Marketing Administration of the United States Department of Agriculture. The first part of this study, on warehouse operations in wholesale frozen food distribution plants was extracted in the October issue.

Platforms

Platforms should be specifically designed for the use to be made of them. Where frozen foods are to be received by rail the platform adjoining the house track should be about 55 inches above the top of the rails, and should be of sufficient width, preferably 15 feet, for easy maneuvering of handling equipment into and out of the refrigerator cars. The center of the rail line should be 8 feet from the edge of the platform to provide sufficient clearance for refrigerator car doors to be opened without touching the platform. A bridgeplate can be used to bridge the gap between platform and the car.

For motor truck receiving platforms a height of 50 inches is desirable when tractor semitrailer combinations are to be unloaded and 45 inches when straight trucks are used. Shipping platforms should be of a height approximating that of the bed of delivery trucks. The normal height for the average-sized delivery truck is about 38 inches.

Whether used for unloading refrigerator cars or motortrucks, platform widths should be adequate to allow free movement of materials-handling equipment. Wholesalers should check the heights of their motor trucks beds and those of other motor trucks which will use the platforms and adjust these heights accordingly. Although small differences in platform and truck bed heights can be overcome by use of bridgeplates rather extreme differences may require a bridgeplate of a length that may partially block the platform. Ability to move materials-handling equipment into the car or motor truck appreciably reduces loading and unloading costs.

Floor of Warehouse

For ease and speed of travel, the floor of the warehouse including the platform should have a smooth surface, preferably of reinforced concrete. Slopes or grades which would interfere with the free movement of materials-handling equipment should be kept to a minimum and should be eliminated where the cost will not be prohibitive. If possible, warehouse floors should consist of a single flat surface, or with sufficient slope to provide adequate drainage, throughout those sections served by handling equipment.

In remodeling old buildings the insulating of floors frequently raises the floor-level in freezer rooms 12 to 18 inches above the level of the uninsulated part of the building. In such cases it is sometimes necessary to build up the floor level of shipping and receiving areas so that merchandise can be moved on a level plane. It is especially important to have the floors in the receiving area built up to the same level as the storage room floors. If not built up, additional manpower may be required to move products "up hill" by way of ramps. Out-bound merchandise moving down a ramp from the order-assembly room to the shipping area may not require additional manpower for handling but a safety hazard is usually involved in moving loaded equipment up and down sharp inclines.

Adequate load capacity should be built into all floors. This capacity will vary depending on the type of equipment used and the load it carries, and the weight of the merchandise and the stacking heights. Particular consideration should be given to floor-load capacity when floors are built above the ground level or above a filled surface. If heavy in-

Fig. 1.—Six-wheel hand trucks loaded with cartons of frozen food. Wholesalers with small-volume operations use smaller trucks than these.

dustrial-type trucks are to be used, the floor load capacity must be considerably greater than when four-wheel hand trucks are used.

Doorways

From the standpoint of materials-handling operations doorways should be located so as to provide as near as possible a straight-line movement between two rooms or areas which they link. The height and width should be sufficiently large to permit easy movement through them of materials-handling equipment loaded with the largest load to be handled. Narrow doorways and aisles can bottleneck operations in a plant where frozen food products will be manually handled, and where large industrial trucks will not be used, doors should be about 6 feet wide. Where mechanical equipment is to be used, doors should be 8 to 10 feet wide and sufficiently high to clear the masts or guard frameworks of industrial trucks. Labor saving devices can be installed which will open and close doors automatically.

In larger plants separate doors might be provided for receiving and shipping. To maintain consistent zero temperature in the storage room, it is desirable that a vestibule at the receiving entrance to the warehouse be provided. An arrangement of this kind is desirable because of the relatively long periods required for unloading railroad cars and trailer trucks into the storage area. The inner doors of the vestibule should be of the double-hinged type that swing both ways.

In plants where the order assembly room is located adjacent to the shipping platform, the outer door of the room is used principally for loading out. In most instances a vestibule at this point is unnecessary because of the small volume loaded out at any time. However, double-hinged type doors, that swing both out and in, should be installed inside the heavy insulated door.

All doors should be constructed of durable material which will withstand continual bumping by hand trucks and other equipment. In recent years doors that swing both out and in have been constructed of rubber. Although the claim is made that rubber doors will last about four times as long as will wooden doors their initial cost is somewhat more than that for wooden ones.

Columns and Ceilings

Consistent with construction costs, columns should be spaced to permit maximum efficiency in handling operations and the greatest utilization of products between two points or cause an excessive number of turns. Where pallets are to be used for storing products, column spacing should conform with the size of the pallet.

In determining proper ceiling heights, consideration must be given to the type of materials-handling equipment to be used and the consequent height to which merchandise is to be stacked. In rooms where products are to be manually stacked a ceiling height of approximately 10 feet may be sufficient. However, if lift trucks are to be used, a ceiling height of 20 feet, which will permit

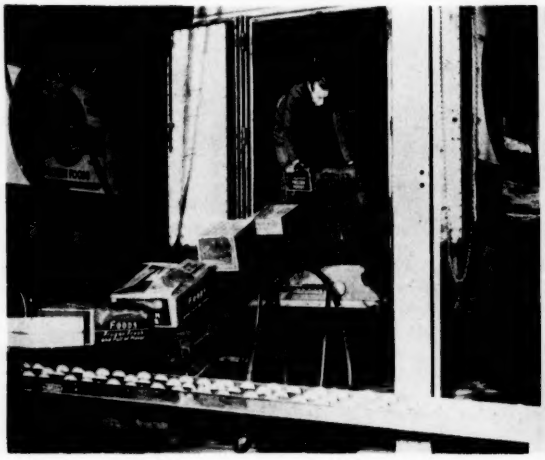


Fig. 2.—Portable belt conveyors, such as the one shown, are useful for moving merchandise from a lower level to a higher one. They can be tied in with gravity conveyors.

Fig. 3.—Gravity conveyors can be used for performing a number of different operations at wholesale plants.

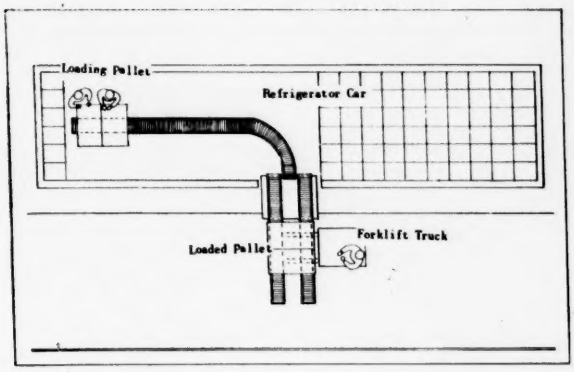


Fig. 4.—(Above) Full conveyor system with curved section allowing pallet to be loaded next to stowed packages in car and moved to a position outside the car convenient for fork-lift truck handling.

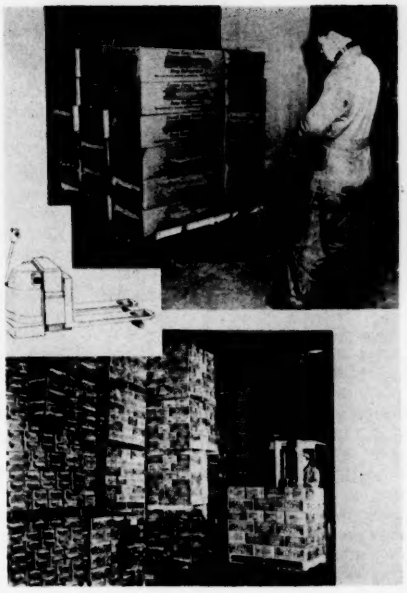


Fig. 5.—(Right) Three examples of equipment used to handle unit loads. A.—Fork-lift truck transporting loaded pallet. B.—Powered walkie low-lift fork truck. C.—Semilive skid loaded with 36 boxes of frozen turkeys. Hand jack is used to lift "dead" end of skid and provide mobility.

the stacking of pallet loads three-high, is desirable.

Aisles should be sufficiently wide to accommodate loaded handling equipment, and the main aisles should accommodate two-way traffic. To accommodate hand trucks, a 5- or 6-foot aisle is of sufficient width. But for the average 2,000- to 4,000-pound capacity counterweight type industrial fork-lift truck, where right angle stacking is used, an aisle width of at least 10 feet is necessary. If angle stacking is used this aisle space can be reduced, but other losses of space may then result from this arrangement.

Requirements Grouped

The types of material-handling requirement adaptable for use by frozen food wholesalers might be grouped as follows: (1) Manual non-unit load; (2) conveyor; and (3) unit load (pallet loads and skid loads). Scale of operation should be one of the major considerations in selecting equipment. As an example, it is doubtful whether wholesalers operating small-volume plants should acquire industrial type trucks one type of equipment for handling unit loads) since overhead of fixed costs might more than offset savings in labor during the expected life of the equipment. Other factors, such as speed of operation and stacking height, might preclude the use of certain types of equipment by some wholesalers.

Four- and six-wheel platform trucks, of the type shown in Fig. 1 are manual non-unit load types of equipment which are of considerable utility value in a frozen food distribution warehouse. The two-wheel hand truck is another type of equipment that has a place in small warehouses, but because of its limited load capacity (500 pounds) it should be used only for miscellaneous short-haul handling tasks.

Platform trucks can be used with a high degree of efficiency for many tasks: For unloading railroad cars and motor trucks; for moving merchandise from storage to the order assembly line; for making up or filling orders; and for loading delivery trucks. When not in use for performing other handling jobs, they may be used for temporary storage, such as holding assembled orders overnight.

Since equipment of this type requires a relatively small investment, ownership or overhead equipment costs are low. Moreover, maintenance is inexpensive, regular oiling being about the only cost involved. Rubber-tired wheels are not recommended for this type of equipment because of the danger of their freezing to the freezer room floors. Steel wheels, which should be used in such plants, are long-lived and rarely require replacement.

The disadvantage of manual non-unit load equipment are significant. When used for moving merchandise from one location to another, each package must be handled individually in loading onto the equipment and it must be handled individually in unloading. Such handling methods discourage workmen from the careful handling required to prevent breakage of original containers. Handling operations are slow, leading to a greater exposure of frozen foods to outside temperatures. Effective use of piling space in refrigerated storage rooms is not possible except by means of manual stacking and removal from stacks.

Conveyors

Conveyors are of two types: Belt (powered) (Fig. 2) and gravity (Fig. 3). Each of these types may be either portable or fixed. Conveyors are highly desirable for moving materials between fixed points, either on one floor or between floors. No substitute has been found for conveyors in the order-assembly line which remains more or less fixed in one position. Conveyors also have an important place in loading delivery trucks particularly when items must be checked as they are loaded. Characteristics which give them an advantage in moving materials between fixed points may however place conveyors at a disadvantage in performing some handling operations.

By use of conveyors the transportation of materials can be accomplished with no labor except that for

loading and unloading. Conveyors also provide a direct flow of materials between the points served. The cost of portable gravity conveyors is low in comparison with the cost of belt conveyors, and gravity conveyors should not be overlooked as a complement to other types of materials-handling equipment. As an example, they frequently can be used to move a loaded pallet from a point inaccessible to a fork-lift truck to a point where it can be picked up by the truck. Fig. 4 shows the use of a conveyor system for removing loaded pallets from a refrigerator car.

There are several objectionable features to the conveyor. Generally it is less flexible than other available types of handling equipment. Since it serves fixed points, set-up time is no small item where materials-handling operations of short duration are performed. When used for loading or unloading railroad cars and trucks, both ends of the conveyor line ordinarily must be manned at all times or the operation must stop. For short installations it is frequently necessary to hold packages until a worker on the other end is ready to receive the package.

In some instances, setting up conveyor lines, as across a platform, may obstruct the simultaneous performance of another materials-handling operation which involves working in an opposite direction to the conveyor line. In other words, the conveyor line can cause an effective "road block" during the transportation cycle of other handling operations. Powered belt conveyors involve high materials-handling ownership costs if they are purchased and used only for a specified purpose or operation which requires only a few hours of use per week.

Unit Loads

Handling of materials in unit loads[1] has a number of advantages. Since packages are handled as a group after the unit load is made up, much labor is eliminated in rehandling and storing operations. Moreover, there is less damage to products handled in unit loads since each package is individually handled fewer times. Where products are stacked or stored in unit loads, inventory taking is simplified since it is necessary only to count the unit loads and multiply by the number of packages per load to determine the total package count. If there are partially empty skids or pallets, the packages remaining on them, of course, must be counted and added to the total.

The tiering features of some types of equipment used for handling unit loads also permits better utilization of piling space without costly manual stacking costs. Finally, even with a small crew the handling of products can be performed in a shorter elapsed time and with fewer man-hours of labor. Where ceilings are low and head room limited, semi-live skids and jacks or dead skis and low-lift platform trucks might be used to advantage.

Disadvantages

There are some significant disadvantages in unit-load handling. The standard type of fork-lift industrial truck requires a rather high initial investment by comparison with some other types of equipment, and as a result the volume handled must be sufficiently large to justify the expenditure. However, a high initial investment is not required for a semi-live skid or dead skid system. Floor capacities must be adequate to support the weight of the loaded truck and tiered items. Some buildings lack this capacity and the fork-lift truck cannot be put into use without costly major alterations to the building.

Powered walkie fork-lift trucks, being of lighter weight, do not require floors with as high a load capacity as heavy fork trucks require. When using fork-lift trucks wide aisles are necessary, as compared with the manual materials-handling equipment. Unit loads also require, except in special cases, a platform (pallet or skid) which uses piling space that might otherwise be used by the product to be stored. For example, an unloaded 40- by 48-inch pallet occupies over six cubic feet of space because of its six inches of thickness which may be an important consideration to a wholesaler who already has inadequate storage space.

Accessibility to frozen food stocks in storage is important to the efficient operation of a frozen food wholesaling business. A wholesaler's plant should be convenient to the warehouse where his stocks are stored. If most of his products are stored in a local public warehouse at some distance from his plant, the cost of transferring these products will be a major expense item. When wholesalers store products for a long term in their private facilities and in packers' or in-transit warehouses only, the location of the frozen food plant in relation to the local warehouse is relatively unimportant.

[1]A unit load comprises several packages placed so that they can be handled as a unit through any handling operation or combination of handling operations, rather than as individual packages. As used in this report, a unit load is a loaded pallet or skid consisting of a number of packages which are so set together that they can be handled simultaneously as a unit.

Underground Warehouse Formally Opened

THE UNDERGROUND refrigerated warehouse installed in a limestone cave near Bonner Springs, Kansas, was formally opened September 20 by the Natural Storage Company, owner and operator of the development and the Union Pacific Railroad which has spent some $90,000 building a rail yard called Coldspur at the cave site.

A special train took most of the participants from the Union Station to the big refrigerated cavern seventeen miles west of Kansas City.

There were many dignitaries including Gov. Edward Arn of Kansas, Mayor Clark E. Tucker of Kansas City, Kansas, top flight executives of several railroads, Kansas City business leaders, and food growers and shippers from many parts of the country. The largest single group was from Louisiana. They called themselves "Yambassadors" and their prime mission was to advertise the fact that they grow 60 per cent of all the yams marketed in the United States.

Ceremonies were opened by Guy E. Stanley, jr., principal owner of the facility. E. P. Scrivner, representative in Congress from the second Kansas district, introduced Governor Arn.

The visitors were transported through the sections of the cave on electrically propelled multicar trains. The ceiling height varies from 16 to 20 feet above the concrete floor.

Giant pillars of stone extend from floor to ceiling. Mr. Stanley pointed out that the rock is limestone and that in such a formation 80 per cent of the rock is mined and 20 percent is left standing to support the roof. The "roof" a sheet of rock seventy-seven feet thick.

Stanley said there now are 245,000 square feet of floor space in the plant and that 800,000 square feet of additional space is ready to be floored and sealed off into carload storage compartments. He placed the present value of the property at more than two million dollars.

The facility is on the main line of the Union Pacific Railroad. The station has been designated "Coldspur," and switch tracks enter the cave so that merchandise can be loaded or unloaded inside at car floor level.

Great Lakes Chapter Elects Officers

AT A meeting of the Great Lakes Chapter, National Association of Refrigerated Warehouses held in Cleveland, October 15, William B. Ready, vice-president and treasurer, Terminal Refrigerating Co., Indianapolis, was elected Chairman. Mr. Ready, who was formerly secretary of the chapter, succeeded Harry Foster, general manager of the Cincinnati Terminal Warehouses, Inc.

William J. Lamping, vice-president and general manager, Grand Trunk Warehouse and Cold Storage Co., Detroit, was elected vice-chairman; William F. Fleig, vice-president and general manager, Evansville Ice and Storage Co. Inc., was elected secretary; and William C. Baker, vice-president and treasurer, Produce Terminal Cold Storage Co., Chicago, was re-elected treasurer.

The elections climaxed a day-long session in which various important industry problems, including handling cost, insurance, controls, taxes and legislation and other outstanding industry problems were discussed freely

Special guests at the meeting were J. L. Gagini, general president of AWA; A. B. Efroymson, president of NARW; H. K. Osgood, director, Warehousing and Storage Division, Defense Transport Administration; and members of NARW's Executive Committee.

Training Conference Changes Dates

IN ORDER not to conflict with the Seattle convention of the Pacific Dairy and Poultry Convention and the Chicago Frozen Foods Convention, the Pacific States Training Conference Dates at San Jose, Calif., have been changed to March 16 to 19, 1953. The conference will be held under the direction of the Refrigeration Research Foundation.

Missouri Valley Members Protest Performance Bond

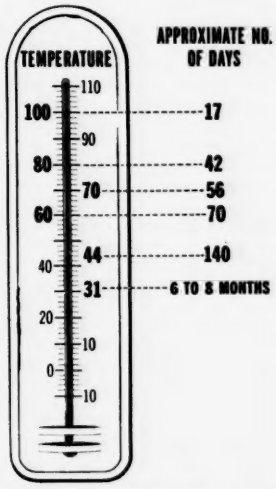
AT THE quarterly meeting of the Missouri Valley Chapter of the National Association of Refrigerated Warehouses, in Minneapolis September 10, the members in session passed unanimously a strongly worded resolution condemning the unfairness of the "performance bond" now demanded by the Commodity Credit Corporation on the storage of their commodities.

Members of the Chapter, especially indignant because of the penalty aspects of the bond, drew up their opposition in the form of a resolution based on the following factors, characteristic of the bond itself: (a) preferential treatment of one industry customer over others; (b) discrimination; (c) unfair precedent; (d) refrigerated warehouse performance already insured through state licensing; (3) industry record for "performance" speaks for itself.

Refrigerated Storage for Auto Batteries

A BOOST for refrigerated storage of wet cell automobile batteries was offered in a recent bulletin issued by the Willard Storage Battery Co. In the bulletin to distributors and wholesalers it strongly urges them to utilize public refrigerated warehouse facilities in the storage of their battery supplies.

Storing batteries in refrigerated rooms makes it possible to keep the batteries up to fourteen times as long before recharging, Willard Storage Battery Company researchers have discovered.



Temperature chart based on discoveries of the Willard Storage Battery Company shows how temperature affects the length of time a battery may be stored before recharging is necessary.

"Handling stock batteries and recharging when required," the bulletin stated, "entails labor and expense. The use of cold storage will minimize this chore, and at the same time, insure that the customer will receive a "Factory Fresh" battery. The use of cold storage facilities are, therefore, highly recommended when batteries are kept in stock thirty days or longer."

Research recently completed by Willard shows that batteries stored under low temperatures can be kept there up to 14 times as long before recharging is necessary. The manual of the Association of American Battery Manufacturers states, "All automotive wet batteries will . . . slowly discharge on standing and will discharge much faster when warm than when cold."

Willard researchers have now found that a battery stored at 100 F will require recharging in approximately 17 days. The same battery stored at 31 F, on the other hand, will not have to be recharged before the end of six or eight months. Willard is therefore urging its distributors and wholesalers to make use of commercial cold storage or to install cooling equipment for storage of stock batteries.

One distributor who is using a cooled basement area for storage reports: "The charge retaining effects of this lowered temperature have been amazing, to say the least. The return on our investment has been truly gratifying."

Refrigerated Warehousing

Warehousemen Formulate Joint Storage Contracts

FORMATION of the Defense Warehousemen's Association of Philadelphia, a voluntary agreement under Government direction between commercial warehousemen to participate in joint military storage contracts, has been approved by Henry H. Fowler, Administrator of the Defense Production Administration. Under the Defense Production Act of 1950, such agreements are authorized when found to be in the public interest as contributing to the national defense. While this pertains to commercial warehouses, the information has much interest to refrigerated warehouses as regards government contracts for storage of military supplies.

The association, which comprises 16 public warehousemen in the Philadelphia area, including Camden, N. J., also has been approved by the Attorney General after consultation with the Chairman of the Federal Trade Commission. Similar associations are nearing completion for Chicago and New York.

The warehousemen's association plan was proposed and developed by the Munitions Board of the Department of Defense and the Defense Transport Administration. Its purpose is to provide the Department of Defense with an administrative plan whereby all commercial warehousemen within a major metropolitan area, qualified to handle general merchandise, can participate in a single joint contract for the storage of military supplies.

Commodities assigned to the area for commercial storage would be distributed among members of the association in proportion to the amount of public storage space operated by each member. In this way, each member warehouseman automatically receives his share of business, and smaller operators also participate with the larger ones in all such business.

The associations are expected to reduce Defense Dept. expenses and to result in more efficient utilization of commercial warehouse space during a period when the nation faces a probable serious shortage of adequate facilities in storing and protecting military supplies. Membership is open to all warehousemen in each association area.

The Defense Warehousemen's Association program is based in principle on the Federal Emergency Warehousemen's Association Plan used successfully during World War II.

Additional associations may be formed if the need develops in particular areas. Meanwhile, the Dept. of Defense is continuing to negotiate contracts with individual warehousemen.

Although the plan now is only being used by the Dept. of Defense, should a more serious emergency arise, it could be extended to other Government agencies having a major need for commercial storage space.

Laboratory Develops Super Concentrated Grape Juice

A NEW "superconcentrated" grape juice which will help fill the Armed Services' need for full-flavor fruit juices in compact form, has been developed by chemists of the U. S. Department of Agriculture.

Dr. G. E. Hilbert, chief of the Bureau of Agriculture and Industrial Chemistry said scientists in the Bureau's Eastern Regional Research Laboratory in Philadelphia had produced a concentrate which can be diluted with six parts of water to one part of juice to make 75 percent more full-strength juice than is obtained from the same volume of frozen concentrates now on the market. A four-ounce can of the new product yields more juice than the present six-ounce can which is diluted only three to one. This high-density concentrate can be used for flavoring ices, confectionery, carbonated beverages, and other foods.

Superconcentrated juice offers many advantages in packing, storing and transportation. As a space saver, it is of special interest for use on submarines, where space is at a premium. It may be frozen or it can be kept satisfactorily in an ordinary refrigerator. In tests at the Laboratory, it was stored at 35 F for as long as a year without spoiling.

The process for making the new concentrate involves stripping the juice of its volatile or aromatic flavors and concentrating these stripped flavors to about 150 times the flavor strength of fresh juice. After the removal of pectin to prevent gelling, the juice is concentrated, and the concentrated flavors returned to it, thus restoring the full fresh fruit flavor. This process was first perfected by the Laboratory in 1944 for apple juice concentration.

Haynes Returns

D. O. HAYNES, author of articles for ICE AND REFRIGERATION on materials handling in refrigerated warehouses returned recently after two months in Venezuela on a special pipe-handling study for The Creole Petroleum Corporation.

Approval Requirements Limit Turkey Storage

IT IS reported that one of the reasons the U. S. Dept. of Agriculture is not accepting all offers of frozen turkeys under its present purchase program is a lack of USDA approved warehouses in some areas. This situation is due to the inability of many warehousemen to meet the strict and apparently discriminatory approval requirements of USDA. While no figures are available to indicate how many offers were declined because of lack of approved space alone, USDA has announced that total purchases to date are only 3,257,600 pounds. Some offers have been declined because of confusion over prices.

A similar situation could develop with respect to USDA shell egg replacement purchase program announced September 26. USDA wants to buy 14, 940 cases in the midwestern part of the U. S. and 500 cases in California. The announcement specifies, however, that deliveries must be made in approved warehouses.

Fire Causes Big Loss To Washington Warehouse

FIRE sweeping through the cold rooms and refrigerated warehouse of the Washington Farmers Cooperative Association in Sunnyside, near Yakima, Wash., did some $100,000 worth of damage. The new building was gutted by the flames, and two of the building's concrete walls collapsed as the result of the explosion which started the conflagration in the cold room and spread throughout. Boiler equipment and considerable refrigeration equipment and machinery was included in the loss. This cooperative numbered as members poultry raisers who were planning to start processing a large quantity of fresh turkeys.

Increased Population Will Need More Food

A 28 PERCENT rise in the nation's population is expected by 1975, according to a report by the President's Materials Policy Commission. The nation's population is expected to climb to 193,000,000 persons by 1975 in contrast to 151,000,000 in 1950. Result will be a need for a 40 percent increase in the output of all products of the land, except timber, to meet the requirements of this enlarged population—42 percent more food will be needed—the bulk of which will be a domestic responsibility. Refrigerated storage is part of this responsibility.

September 30 Cold Storage Holdings

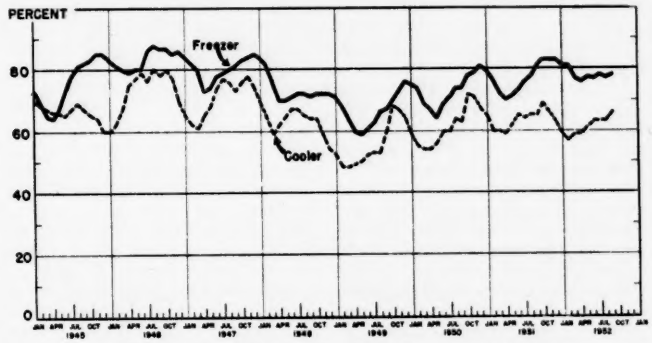
UTILIZATION of public cooler and freezer storage space on September 30 was 66 and 78 per cent respectively according to reports received by the U. S. Department of Agriculture. Gains during September increased cooler use by two points which brought the occupancy level (66 per cent) to its highest point of the year and also to the top-most level reported on September 30 since 1947. Except for decreases in cooler occupancy reported in the East North Central, West North Central, and Mountain regions, reports from all the other geographic regions indicated higher levels of occupancy on September 30 than at the end of the previous month. The increases ranged from 1 point in the South Atlantic and West South Central to 9 points in the Pacific Coast States.

Following the pattern indicated by the 5-year average change, end-of-month occupancy in public freezer space increased one point to 78 per cent by the end of September. Although this storage occupancy was 3 points above the September average, nevertheless it was below last year's level by a like amount. Sharp gains in freezer occupancy were reported by warehousemen in the New England, Middle Atlantic, Mountain, and Pacific States as increases ranged from 3 to 7 points from August 31 to September 30 but decreased occupancy prevailed in the West North Central, South Atlantic, and East South Central States during this period.

The net weight of commodities held under refrigeration on September 30 totaled 3.9 billion pounds or a gain of five per cent since August 31. All of this increase was accounted for by a seasonal net gain of 247 million pounds in cooler held commodities which totaled 1.7 billion pounds at the end of the month. This compares with 1.8 billion in store last year and average September 30 stores of 1.9 billion pounds.

Commodities reflecting net storage gains were as follows: apples, pears, cheese, grapes and fresh vegetables. During September net withdrawals from freezer storage of cream, butter, frozen eggs, and pork products more than offset the net accumulations of frozen fruits, frozen vegetables, poultry and beef and by the end of the month national holdings of freezer stored commodities were down to 2.2 billion pounds or a decrease of 45 million pounds from the previous month.

The number of bushels of apples and pears reported in storage totaled a little more than 10 million of which almost 6 million bushels were apples. September 30 last year apple stocks amounted to almost 8 million bushels while about 9 million bushels are the average September 30 stores. Likewise, holdings of pears were below last year's and average September 30 stores. With less than 5 million bushels reported in storage, current hold-



Occupancy of Refrigerated Warehouses, 1945-1952

TABLE 1—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Sept. 30, 1952	Aug. 31, 1952	Sept. 30, 1951	Five-year Average
Meat and meat products, lbs.	579,602	701,062	521,665	413,934
Lard and rendered pork fat, lbs.	106,683	124,296	28,372	71,509
Frozen poultry, lbs.	182,690	144,508	166,242	150,599
Creamery butter, lbs.	110,571	111,400	113,501	134,566
American cheese, lbs.	228,741	222,933	239,500	213,456
Other cheese, lbs.	22,266	23,043	23,531	24,654
Shell eggs, cases	1,692	2,169	958	1,884
Frozen eggs, lbs.	121,754	144,326	151,293	164,701
Apples, bu.	5,615	238	7,684	8,989
Frozen fruits, lbs.	325,271	317,254	387,929	349,178
Frozen vegetables, lbs.	524,406	463,011	515,766	395,172
Frozen fish, lbs.	189,208	183,826	166,100	150,242

TABLE 2—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Filing Space (000 cu. ft)		Sept. 30, 1952 (%)		Aug. 31, 1952 (%)		Sept. 30, 1951 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,983	6,273	44	77	36	73	49	90	57	77
Middle Atlantic	28,630	33,635	64	85	58	82	59	84	58	79
East North Central	30,054	29,911	69	80	71	80	75	79	72	73
West North Central	8,792	16,866	65	63	68	69	65	71	72	71
South Atlantic	7,511	9,417	67	72	66	73	65	79	63	74
East South Central	3,092	4,066	91	86	89	89	75	87	78	83
West South Central	7,030	7,521	65	60	64	59	61	62	63	59
Mountain	1,093	1,978	49	80	54	73	46	84	61	78
Pacific	13,627	21,196	67	85	58	81	63	84	62	76
United States	102,815	130,857	66	78	64	77	65	81	65	75

TABLE 3—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Sept., 1952		Sept., 1951		Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Sept., 1952		Sept., 1951	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England					56	81						
Middle Atlantic	1,494	1,181	59	63	64	88	970	236	95	86	64	83
East North Central	3,620	5,342	71	42	64	45	4,783	981	81	73	80	79
West North Central	229	1,053	59	75	67	68	7,193	5,648	83	77	90	69
South Atlantic	624	3,181	25	70	25	76	366	172	100	100	86	99
East South Central					69	91					90	86
West South Central					98	95	75	116	100	100	100	100
Mountain					42	87	147	145	89	100	95	98
Pacific	1,375	1,857	52	79	56	69	525	312	91	93	89	87
United States	7,342	12,614	60	58			14,059	7,610	84	79	86	76

NOTE: Blank spaces indicate that insufficient returns were received.

ings were approximately one-fourth less than in 1951 and 11 percent less than the 1947-51 average.

Net accumulations of frozen fruits brought national holdings up to 325 million pounds by September 30. The increase from August to September of 8 million pounds was equal to the change last year but was four times greater than the average September increase. Commodity-wise, holdings of frozen apples, cherries, respberries, strawberries. Young, Logan, and similar berries were reduced during September by amounts ranging from a few thousand pounds (Young, Logan and similar berries) to nine million pounds (cherries), while gain up to 11 million pounds (peaches) were reported for other frozen fruit items.

Frozen Vegetables

Stocks of frozen vegetables on hand September 30 almost equalled the record holdings last year (554 million pounds) as net accumulations during the month of 61 million pounds brough national stocks to 524 million pounds. Except for frozen asparagus, green peas, and spinach all frozen vegetable items reflected September storage gains. Lima beans increased 35 million pounds to 77 million; a 24 million pound gain brought sweet corn stocks up to 52 million pounds; snap beans increased 4 million pounds. The decrease in frozen pea stocks brought holdings down to 190 million pounds which compares with 183 million in store a year ago. Orange concentrate stocks were down to less than 18 million gallons as compared with 16 million last year. The net disappearance of 3 million gallons during September was half again as much as the withdrawal in 1951.

Less than average net withdrawals of creamery butter brought national stores down to 111 million pounds as only 800,000 pounds moved from storage during September. A year ago the August to September change was a decrease of three million pounds while average September net withdrawals are five million pounds. A sharp gain in storage holdings of cheese increased total holdings to 260 million pounds of which 229 million pounds were American Cheddar.

The seasonal decline in shell egg stocks brought total holdings down to 1.7 million cases which compares with a September 30 average of 1.9 and last year's stocks of less than a million cases.

Holdings of frozen eggs were reduced during September to 122 million pounds as net withdrawals during the month totaled 23 million pounds which were slightly less than average and the withdrawals last year.

September 30 holdings of frozen poultry were up 38 million pounds from the previous month to 183 million pounds. Current stocks were the third largest on record for September 30 as the net increase during the month exceeded average September gains but fell short of the increase last year—45 million pounds. Broiler, fryer, and roaster stocks reflected little change from the previous month with about 3, 11 and 7 million pounds respectively in store. Fowl and turkey holdings, on the other hand, increased 6 and 26 million pounds respectivelyl to bring the former to 42 million pounds and the latter to 70 million pounds.

The net change in storage holdings of meats during September was in accordance with the seasonal pattern but the extent of this change was much greater. Whereas average September net withdrawals are 91 million pounds, last month a total of 121 million pounds, net, were withdrawn from storage. This net dissappearance was accounted for almost entirely by the decline in pork stocks 121 million pounds) which fell from 407 to 286 million pounds. While holdings of other meat items, except beef, also reflected a decrease — 10 million pounds — the movement was countered by a net gain of the same amount in holdings of beef. With the exception of dry salt and other cured pork, all meat and meat products showed larger holdings than September 30 a year ago. Lard and rendered pork fat stocks were reduced 18 million pounds to 107 million which compares with 28 million on hand last year and 72 million pounds in store September 30 during the 5-year period ended 1951.

Storage Outlook

By the end of October, cooler occupancy should be greater than the 66 percent reported on September 30 because of the net accumulation of apple holdings. According to past performance an increase of 5 points is not unlikely but whether this will prevail during October will depend on the movement of apples into storage which so far has been below average and the rate of movement from storage of cheese and shell eggs. Indications are that freezer occupancy should continue to increase as frozen poultry and frozen vegetables move into storage. Last during October by 2 points and the 5-year average change indicates a gain by this amount, too.

Cold Storage in India

THE number of cold-storage plants for perishables in India increased from 20 to 112 during the period 1948-51, states an article in the Calcutta Amrita Bazar Patrika Independence Day Supplement of August 15.

Cold-storage space available for perishable foods increased about 1,000 percent—from 145,000 maunds to 1,640,000 maunds in 1951. The development of cold storage offers a practical solution to the problem of reducing wastage and insuring equitable distribution of perishable foodstuffs throughout the country.

FrozenFoods*

*Reg. U. S. Pat. Off.

PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

Production of Frozen Orange Juice Increasing

CONFIRMATION of trade estimates for another record production of Florida frozen orange juice concentrate for the 1951-52 season has come from the Florida Canners' Association.

Output of this product for the season just ended was officially placed at 44,030,633 gallons. This yield was sharply above the 30,757,656 gallons produced during the 1950-51 season, and more than doubled the 1949-50 output of 21,647,447 gallons.

Frozen orange juice concentrate has consistently chalked up new production records ever since its inception in 1945. Indicative of this trend, production in the 1945-46 season amounted to 226,000 gallons; in 1946-47, 559,000 gallons; in 1947-48, 1,935,000 gallons; and in 1948-49, the output totaled 10,232,000 gallons.

With plantings from recent years now beginning to yield, the crop of oranges in Florida this season is expected to total between 82,000,000 and 83,000,000 boxes, according to the Department of Agriculture. The output of oranges in that State for the 1951-52 season amounted to 79,000,000 boxes.

As a result of the increased orange yield, production of frozen orange juice concentrate for the 1952-53 season is expected to total between 50,000,000 and 52,000,000 gallons, with processing scheduled to start sometime in December.

Perhaps even more astonishing to the industry than the sharp increases in production has been the ready consumer acceptance of this product and the resultant record-breaking dollar volume totals racked up by retailer outlets.

For the first nine months of the 1951-52 season, the Department of Agriculture revealed, purchases by housewives were fully two-thirds above the level of the preceding season. This has been accomplished through aggressive merchandising and broad consumer education as to the nutritional values of the product.

While frozen orange juice concentrate continues to set the pace for the frozen foods industry, other citrus juice concentrates are also selling better.

Grapefruit Juice Yield

Production of frozen grapefruit juice concentrate in the 1951-52 season, according to the Florida Canners' Association, totaled 1,097,564 gallons. The output of frozen blended concentrate in 1951-52 amounted to 535,703 gallons.

A newcomer to the frozen juice field was tangerine juice concentrate. Production of this product during the season just ended totaled 349,161 gallons.

Pack of Frozen Asparagus

THE 1952 pack of frozen asparagus amounted to 24,811,760 pounds, according to a preliminary compilation by the National Association of Frozen Food Packers. This total was approximately 5 percent greater than the 1951 pack, and the second largest pack on record. Only in 1946 was a larger pack produced. In that year production was 28,316,074 pounds.

While the pack in the Midwest declined this year, production in the East and South and in the West was larger in the current year than in 1951.

Some developments in container-sizes usage are worth noting. The pack in the 10 oz. size increased significantly, and the 12 oz. retail pack also advanced moderately. On the other hand, the 2½ pound institutional pack dropped off notably.

The total United States pack is shown by years as follows.:

Year	*Pounds*
1942	5,769,452
1943	9,619,255
1944	12,339,171
1945	20,637,590
1946	28,316,074
1947	10,737,171
1948	18,321,209
1949	18,422,240

Frozen Juice Sales Up

FROZEN concentrate juice sales are booming. A total of 3,970,000 gallons of frozen concentrated orange juice were bought in July, according to the U. S. Department of Agriculture. This is 4 percent greater than June purchases, and more than double the volume bought in July of 1951. Purchases of frozen concentrated lemonade also increased sharply in July. The total was 1,379,000, 73 percent greater than in June.

1952 Pack of Frozen Green Peas Shows Increase

THE total pack of frozen green peas during 1952 was 204,606,874 pounds, a greater volume than was produced in any preceding year.

Important changes in regional production were recorded this year. The pack in the East and South declined nearly 30 percent from 1951, but this reduction was more than offset by the important increase in the pack put up in the West. The pack in the Midwest showed little change from 1951 to 1952.

The most significant development in container-size usage was the big increase in the pack in the 10 oz. retail size, and the corresponding decline in the 12 oz. pack total. The small institutional pack showed a moderate increase over 1951, with the 2½ pound size registering a gain and the 5 pound size declining. The bulk pack was larger this year than ever before.

Total United States pack of recent years was as follows:

YEAR	POUNDS
1942	59,077,163
1943	70,310,152
1944	79,152,398
1945	103,833,553
1946	140,602,919
1947	131,785,783
1948	118,976,557
1949	113,273,030

Can Fish Be Refrozen?

WHETHER fish can be refrozen is a frequently discussed question and the best way to answer it for practical purposes is to assess the quality of the fish. If the quality is very good when found defrosted, the chances are that the fish can be refrozen. If quality has dropped (probably because of loss prior to original freezing), it is likely that they won't be able to stand further freezing.

It has been observed, according to J. M. Lemon of U. S. Fish & Wildlife Service, that after a long frozen storage period, the tissue in refrozen fish is often spongy and tasteless. This trouble is probably due to mishandling earlier. Present information is, however, inadequate. Mr. Lemon, serves TRRF as a member of the Scientific Advisory Council, TRRF Bulletin.

Frozen Foods

Frozen Food Production By United Kingdom

THE BRITISH frozen food industry provides only a small part of the total food supply, despite rapid progress in recent years, according to The Foreign Commerce Weekly. The quality of production is good. Meat rationing makes it difficult to market frozen meats, so the output consists mainly of vegetables and fruits.

Production of frozen vegetables in 1951 totaled 6,506 long tons. Green peas made up the bulk, followed by green beans. A fairly wide range of other vegetables have been available. Last year's output of frozen fruit amounted to 1,961 tons, compared with 1,280 tons in 1950. Strawberries and strawberry puree, blackberries, gooseberries, raspberries and raspberry puree, and loganberries were the principal items.

The Netherlands and Belgium have been chief suppliers of imported frozen foods, but recent import restrictions will reduce future shipments. In 1951, 1,447 tons of frozen vegetables were imported, compared with 1,043 tons in 1950. In the first 7 months of 1952, imports amounted to 677 tons against 631 in those months of 1951. The frozen fruits imported included pineapple, apricots and peaches.

A large quantity of bulk frozen fish is imported, and sold by fishmongers; frozen fish in consumer-size packages, while not yet important, is growing in popularity.

The first quick-freezing plant in Britain was opened in Wisbach, Cambridgeshire, in 1934. The industry subsequently was hindered by shortages of equipment and by actual suspension of operations during World War II. Operations have expanded since the war.

Only about half a dozen of the 30 or 40 processors in the United Kingdom produce significant amounts of frozen foods. Only three or four attempt national distribution of their output. One of the large packers uses a different trade-mark for each of its several grades of product.

While it is expected that British production, as well as consumption, of frozen foods will continue to expand, a limiting factor is their high cost in relation to average income. Another problem is the shortage and high cost of production equipment.

Prospects for U. S. exports of frozen foods and equipment to the United Kingdom do not appear very bright for the immediate future. Possibilities may exist, however, for an export trade in certain items from the United Kingdom to the United States.

Deep Freeze as Anaesthetic For Surgical Operation

A SUCCESSFUL heart operation on a human being with refrigeration used to slow down bodily processes was reported recently by the University of Minnesota. University medical authorities said they believed it was the first successful operation of its kind.

The operation was performed at University Hospital September 2. The patient was a five year old Minnesota girl who had suffered from a heart defect since birth. The child had a small hole between two sections of her heart. This upset the normal flow of blood through the heart. The result was that one section was overworked and enlarged.

The operation was performed by Dr. F. John Lewis, 36, associate professor of surgery. He was assisted by Dr. Richard L. Varco, top heart surgeon at the hospital and Dr. Mansur Taufic, a fellow in surgery.

Before the operation the girl's temperature was lowered from the normal 98.6 degrees to 81. This made it possible to shut off circulation of blood for five and a half minutes, nearly twice as long as can be done with ordinary anesthesia. Shutting off the circulation made it possible for the surgeon to see just what he was doing. Operations of this kind have been done by touch because blood shut off the view of the interior of the heart.

Before the operation the girl was given an anaesthetic and was wrapped in a rubberized blanket. The blanket was made of two layers of canvas with sections of rubber tubing between them. Through the tubes was pumped an alcohol mixture cooled mechanically to near the freezing point of water.

After she was chilled for about two hours, the child's temperature dropped to 81. Her pulse rate fell from 120 to 70 and, Dr. Lewis said, oxygen needs of her body dropped by about 50 per cent. During the hour-long operation, the girl's temperature fell to 79.

Blood circulation was stopped by closing veins entering the heart. The heart, however, continued to beat. Dr. Lewis then cut open the heart and sewed up the hole between the two sections.

After the operation, the child was put in a tub of water heated to 114 degrees. She was restored to normal temperature in 40 minutes. Surgeons pronounced the operation a success. The girl was released from the hospital 11 days later.

Dr. Lewis estimated that it would have been possible in this case to shut off circulation for as long as eight minutes if that had been necessary. Normally circulation cannot be stopped much longer than three minutes without serious damage to the brain cells.

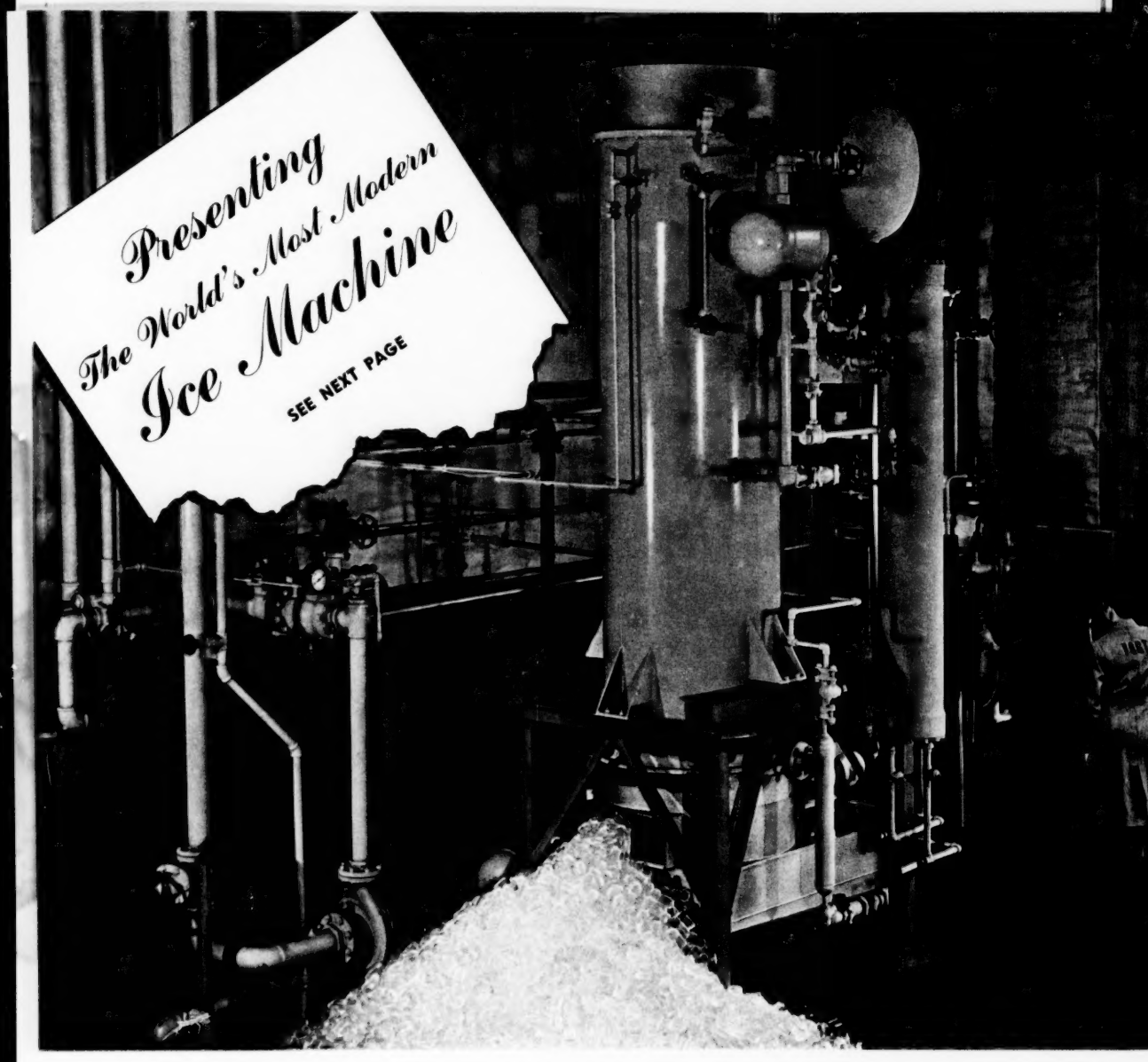
Frozen Food Packers Plan Nutritional Program

A MEETING of the Board of Directors of the National Association of Frozen Food Packers was held in Washington October 3. Presiding was President C. L. Snavely, Consumers Packing Company, Lancaster, Pa. Routine business was transacted, current activities reviewed and decisions reached on the future development of several important projects.

The Board was advised of the progress made in developing the Association's Nutritional Program, and approval was given to recommendations to the Nutritional Administrative Committee for proceeding with this program. H. J. Humphrey, Birds Eye Division of General Foods Corporation is Chairman of the Committee. A long-term program of nutritional research is contemplated to meet an ever-increasing demand for Nutritional information on frozen foods. The program will be financed by Association funds and industry contributions.

A progress report was submitted to the directors on an educational brochure designed to improve frozen food handling practices at all levels of distribution. This brochure, now being prepared, will drive home to all handlers the importance of giving proper care and protection to frozen foods. Emphasis will be given to the potential danger to the industry that may result from undesirable handling practices: loss of flavor, appearance and nutritional content. Specific recommendations on protecting frozen foods will be offered to each segment of the trade.

The Board also discussed a problem that has arisen with respect to label nomenclature for Frozen Concentrated Lemonade. Conferences with the Food and Drug Administration on this subject are continuing, but no final decision has yet been reached. The Association conducted a consumer survey, the results of which are indicative of homemakers' views on labeling nomenclature for this project. The results of the survey have been furnished to the Food and Drug Administration.



Many packers and shippers of meat, fish, poultry, fruit, vegetables and dairy products, in addition to ice plants and process industries, are enjoying decided ice production economies through the Tube-Ice process originated by Vogt in 1938.

Here are some of the important advantages of the Vogt Automatic Tube-Ice Machine:

LESS SPACE: The complete ice plant pictured here is of 18 tons per day capacity and can be accommodated in floor space 15' wide by 20' long . . . requiring as little as 15 per cent of the space taken by block ice equipment of equal capacity!

FASTER: Only 13 MINUTES are needed to freeze, thaw and evacuate "crushed" Tube-Ice, and 40 MINUTES for "cylinder" Tube-Ice, in contrast to the 40 to 50 HOURS for block ice.

GREATER ECONOMY: The Tube-Ice process utilizes direct application of the refrigerant to the ice freezing surfaces thereby eliminating all power costs incidental to brine systems.

SAVES LABOR: Wholly automatic in operation and discharging ice in its ultimate sized form, the Tube-Ice Machine requires no labor and only a minimum of supervision.

Shown here in operation in our Experimental
34" diameter freezer. Incorporated in this unit are exclusive f
work, as follows:

- ★ A Water Pre-Cooler promotes uniformity of the ice cylinders frozen in the tubes and is furnished when top quality ice is essential.
- ★ Dual Pressure Controls regulate refrigerant temperatures in the freezer and the water pre-cooler to appreciably lessen ice crazing and cracking.
- ★ An Accumulator serves as an expansion chamber for the liquid feed, provides a steadier liquid level in the freezer, and prevents liquid carryover to the compressor.
- ★ Vented Water Distributing Ferrules in each tube improve ice quality by equalizing

erimental Department is a Tube-Ice Machine with a
clusive features resulting from years of development

water distribution throughout the freezing cycle.

- ✱ An automatic Blow-Down reduces concentration of solids by discharging a controlled percentage of the water in the pumping tank during each thawing period.
- ✱ Gas Injection Thawing controls the refrigerant temperature to provide for the discharge of high quality, clear ice.
- ✱ Reversible Cutter and Scraper Discharge eliminates need to adjust cutter for different types of ice and the design reduces height of the unit to a minimum.

Vogt

Automatic
TUBE-ICE MACHI

Patent Numbers 2,200,424-2,239,234-2,396,308-2,444,514-2,453,140 Other Patents Pending

Manufactured by **HENRY VOGT MACHINE CO., LOUISVILLE 10,**

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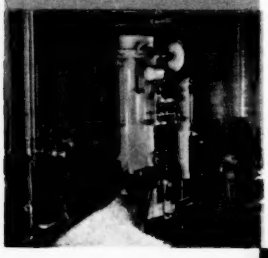
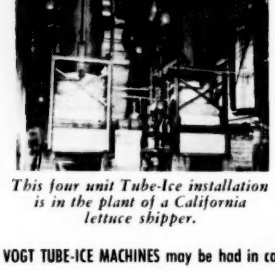


TUBE-ICE IN USE ACROSS THE NATI

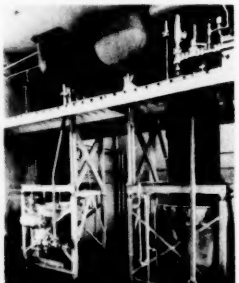
SOME OF THE LEADING INDUSTRIES NO

A 60 ton per day capacity Tube-Ice unit provides ice and cold water for a large mid-western dairy.

A modern brewery obtains both cold water and Tube-Ice from this installation.



This four unit Tube-Ice installation is in the plant of a California lettuce shipper.



Two Tube-Ice units serve a modern ice plant.

VOGT TUBE-ICE MACHINES may be had in capacities to meet specific requirements and inquiries for additional information will receive our prompt attention.

2000 pound and 5000 pound capacity Tube-Ice Machines are available as complete package units. They are assembled, insulated, wired, piped and tested before shipment. Only water and electrical connections are needed to place them in operation.

COMMERCIAL ICE PLANTS: Ice manufacturers are the growing demand for sized ice by installing Tube-Ice operating economies yield increased profit margins b per ton to a new low.

DAIRIES: A Tube-Ice Machine has the unique ability cold water and ice from the one unit . . . two essential to process milk and butter and to guard freshness of the

MEAT PACKERS: Sized Tube-Ice is easily handled spouts to fill ice bunkers when shipping meat. It permits of air to lower temperatures quickly and evenly in the

FISHERIES: Fish, delicately flavored and highly peri kept continuously in ice until sold to the consumer. preserve much of the catch here and abroad.

POULTRY PACKERS: Cylinder Tube-Ice is used to re and in crushed form it completely surrounds each carcas container. Both kinds of ice provide the greatest possi effect to enhance poultry quality.

VEGETABLE AND FRUIT PACKERS: Lettuce, melo other highly perishable produce are kept fresh and wholes distance shipping and in storage by layers of crushed Tul

BREWERIES: Cold water, for wort cooling, is made duri Tube-Ice unit and ice, made during the off peak period, water tanks for maximum refrigeration economy in the

HOTELS, CLUBS, RESTAURANTS AND HOSPITA unequalled for maintaining the freshness and quality beverage cooling in these institutions. Produced free o it meets all the sanitary requirements of health authori

REFRIGERATION CAR SERVICE: Carload shippe foods depend on Tube-Ice in the car bunkers and ove maintain proper refrigeration during the five to nine cars are usually in transit.

Henry Vogt Machine Co., Louisvil

Also makers of **Drop Forged Steel Valves, Fittings and Flanges • Steam Generators • Petroleum Refinery and Chemical Plant Equipment • Refrig**

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SPITALS: Tube-Ice is
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isville 10, Ky.

Refrigeration Equipment — Since 1880

New Canadian Refrigerator Car Offers Many Needed Improvements

THE FOLLOWING additional information has been furnished on Canadian National Railways Refrigerator Car 210,000, an illustrated description of which was published in the October ICE AND REFRIGERATION (page 11).

Background—Railway refrigerator cars have improved over more than a half-century from ordinary box cars carrying a crude form of ice bunker to heavily insulated refrigerators on wheels that can travel from coast to coast maintaining temperatures from freezing point to zero, depending on the nature of the perishable cargo. Such cargoes include meat, fruits, fish, frozen foods, including frozen juice concentrates, for example.

Economics—With all its refinements the present-day railway refrigerator car is still a box with ice in it. Ice is cut in winter, or manufactured, and stored at a dozen major icing points between the east and western Canadian seaboards. Cars are re-iced at these points as perishables move across the nation. It cost the C.N.R. a quarter-million dollars to cut and stockpile 156,000 tons of ice in western Canada alone last year, mostly for use in refrigerator cars.

If a mechanical refrigerator is incorporated into the car it would avoid re-icing the car and also protect the contents if any delay occurred before it reached an icing station. But the railwaymen have to be sure of two things before adopting mechanical refrigeration: that the mechanism is foolproof and will work without failure during the course of a 3,000 mile journey and that it will compete price-wise with the present method of refrigeration.

CNR Refrigerator Car 210,000—was built in the CNR's shops to provide a testing vehicle for mechanical refrigeration of railway freight cars. So as not to reduce the payload, the refrigerating equipment was slung under the car and can be swung out for intermittent servicing without opening the car doors.

The equipment is also capable of providing heat to the cargo in winter. Too much cold is as destructive to perishables in winter as too much heat in summer. It consists of a two cylinder diesel engine, an electric generator, compressor, a 250 gallon fuel oil tank and thermostatic controls to maintain constant temperature.

A flick of a switch transfers power from the refrigerating machinery to a bank of electric heaters located in the ceiling of the car. The ducting and blowers are common to both the heating and cooling systems. They are designed to provide uniform temperatures throughout the car. To ensure this two thermometers are provided outside the car so that the railway carmen can read them. One measures temperature at the top and the other at the floor of the car.

The Current Tests—Car 210,000 has already carried a load of fresh beef from Toronto to Halifax. It's severest test is the current one from Prince Rupert to New York. The cargo is 50,000 pounds of salmon taken in the North Pacific fishing grounds. Although the car passed through snow in Alberta and temperatures running in the high nineties through southern Ontario the temperature stayed an even five degrees below zero. The next test will be with fresh fruit from the Niagara district to eastern Canada.

The Interested Parties — Interested in the new car are both railways, shippers of perishables, the National Research Council and manufacturers of the diesel generator and the refrigeration mechanism. They are accompanying the car as it moves by fast freight, in a tourist car with 12 on board.

All the tests are being made under the eye of John L. Townshend, general supervisor of perishable traffic for Canadian National Railways. His headquarters are in Montreal. Mr. Townshend's lifetime of 31 years with the railway has been devoted to reversing the seasons: making heat in winter and cold in summer. The car under test was built to his specifications dictated by years of knowing what grower, packer and customer require to market their produce at the peak of quality.

Frozen Pineapple Juice Shipped from Hawaii

THE FIRST shipment of frozen pineapple juice concentrate arrived in Boston from Hawaii aboard the S.S. Steel Rover September 21. The shipment consisting of 15,000 cases is reported to be the first of regular shipments of this product. On October 10 the S.S. Hawaiian Banker was scheduled to reach Boston with a second shipment. Thereafter frozen concentrate shipments will arrive in Boston monthly. The first of similar monthly shipments to New York is reported to have arrived at that port also.

Air Conditioning Sales

AN UNUSUALLY warm summer this year created record sales of room air conditioners, and an equally big year is expected in 1953 when families who observed "comfort production" in neighbor's homes this year decide to "keep up with the Joneses."

Room air conditioner dealers note that provision of a haven from the heat costs about one-tenth as much as equipping a home for winter heat. Furnace, electric heater, electric blankets, furnace and fuel for a year, fireplace logs, home insulation and storm windows can mount up to $3,000. Window air conditioners are available for around $300, some more, some less.

A Warning That Was Not Heeded

"I PLACE economy among the first and most important virtues, and public debt as the greatest of dangers to be feared. To preserve our independence, we must not let our rulers load us with perpetual debt. We must make our choice between economy and liberty, or profusion and servitude. If we run into such debts, we must be taxed in our meat and drink, in our comforts, in our labors and our amusements. If we can prevent the government from wasting the labors of the people under the pretense of caring for them, they will be happy. The same prudence which in private life would forbid our paying our money for unexplained projects, forbids it in the disposition of public money. We are endeavoring to reduce the government to the practice of rigid economy to avoid burdening the people and arming the Magistrate with a patronage of money which might be used to corrupt the principles of our government."

—THOMAS JEFFERSON

Wonder what Thomas Jefferson would say about the extortionate and ever mounting taxes of today.

Standards for Frozen Lima Beans Amended

THE sixth issue of the United States Standards for Grades of Frozen Lima Beans has been amended, to become effective July 30, 1952. The fifth issue of the standards which became effective on May 30, 1952, should be discarded.

These standards are designed to serve as a convenient basis for sale in wholesale transactions and as a basis for determining loan values. They will also serve as a basis for the inspection of this commodity by the Federal inspection service, which service is available for inspection of other processed products as well.

Smaller Frozen Food Packages Not Popular

SMALLER size packages of frozen foods are not proving very popular with refrigerated warehousemen, according to spot checks made by NARW. Opinions are that the small package results in increased handling, higher costs, lost piling space and a substantial increase in the ratio of tare to net weight.

Several warehousemen are experimenting in cooperation with their customers with bundling these packages into larger units. This procedure appears to hold greatest promise of eliminating present handling difficulties.

Spring Pack Frozen Spinach

THE Spring pack of frozen spinach this year was at a record high level, according to a compilation prepared by the National Association of Frozen Food Packers. A total of 58,286,756 pounds was packed during the period from January 1 to June 30, 1952. This total was 6 percent greater than the spring pack last year, and far greater than that of any earlier year. Increased production in Western states accounted for the boost in the national pack. Production in the East and South was a bit smaller than last year.

As in past years, the bulk of the frozen spinach pack went into 14 oz. retail containers. Altogether, retail sizes accounted for more than 75 percent of the total pack. Even though the retail pack continued dominant, most of the increase in production from 1951 to 1952 was accounted for by expansion in the pack of 2½ pound container size. The three pound container again in 1952 was also important as a small institutional size for Frozen Spinach.

The total United States pack is shown by years as follows:

Year	*Pounds*
1944	12,794,679
1945	12,661,154
1946	18,306,950
1947	11,779.585
1948	19.460,909
1949	37,348,572

National Power Show Covers Wide Scope

EVERY going industry is included in the scope of the 20th National Exposition of Power and Mechanical Engineering, which will be held in Grand Central Palace, New York, December 1 to 6 under the auspices of the American Society of Mechanical Engineers. The event coincides with the ASME annual meeting, and many of the exhibits at the show will exemplify subjects under discussion by the engineers.

The exposition covers all branches of the field of power from the conversion of energy into fluid forms, such as heat, light, flowing water and steam, as well as hot, cold and compressed air, to its application in moving mechanisms. It includes the conversion processes themselves, such as the combustion of fuels, generation of electricity and the operation of heat exchangers, pumps and blowers; distribution in transmission lines and pipelines, and it includes all the many applications within the industrial plant, through wires, piping, shafting and belts, whether or not it generates its own power or buys it from a public utility. Major exhibit classifications include air conditioning and materials handling equipment.

Ice Cream Costs Higher

EXPENSE comparisons this year, as conducted by the International Association of Ice Cream Manufacturers Department of Statistics and Accounting, are very revealing, pointed out Paul B. Beck, manager of the department.

Ice cream costs have arisen exactly 10 per cent over 1950. The substantial increase, which was 13.68 cents per gallon, affects practically every bracket of expenses. The weighted average costs for all districts in the United States were:

	1951	1950	Increase
Product Cost	.7400	.6583	.0817
Manufacturing Cost	.3118	.2749	.0369
Selling and Advertising Cost	.1483	.1423	.0060
Delivery Customers Service Cost	.2501	.2400	.0101
Administrative Cost	.0546	.0525	.0021
Totals	1.5048	1.3680	.1368

What caused the costs to increase 13.68 cents per gallon? Nearly everything, but the cost of products and ingredients accounted for the greatest increase. Generally, the increases and decreases per gallon were:

Increases	
Products and Ingredients	.0817
Wages	.0208
Supplies	.0279
Advertising	.0005
Taxes and Insurance	.0013
Bad Debts	.0005
Miscellaneous	.0121
Total Increases	.1448
Decreases	
Depreciation	.0009
Repairs	.0036
Power, Refrigeration and Water	.0033
Automatic Freight and Dry Ice	.0002
Total Decreases	.0080
Total Increases	.1448
Total Decreases	.0080
Net Increase	.1368

Carrier Offers New Air Conditioner for Homes

THE CARRIER Corporation is beginning a drive to air-condition fully homes selling from $10,000 up, Cloud Wampler, president, revealed recently. He reported a unit that will air-condition $10,000 homes all year at a cost within the reach of their owners.

The unit was shown at the Sherry Netherlands Hotel, New York City, October 2, where Carrier introduced its 1953 air conditioning line to the press and dealers. It is a two-ton model called the Weathermaker and provides cooling and dehumidifying in the summer and heating in the winter.

Declaring that the unit is designed specifically for the $10,000-and-up mass market, Mr. Wampler said its cost to distributors will be 25 per cent less than the smallest complete air conditioning unit Carrier now has on the market.

Chicago Section, A.S.R.E. Observes Centennial of Engineering

THE September 11 meeting of the Chicago Section of the American Society of Refrigerating Engineers was held in cooperation with the Centennial of Engineering. All centennial members and guests were welcome. The Centennial of Engineering comprised over 40 participating technical societies commemorating the world's first 100 years of engineering progress. How is it that we of the United States produce over 50 percent of the world's goods when we have only 7 percent of the world's population and only 6 percent of the world's land area. This is the outstanding accomplishment of American engineering and the incentive in back of the celebration was to make the public more conscious of the services of the engineer.

National Officers and Other Guests Present

The national A.S.R.E. officers were present. President Edward Simons highlighted an anlysis of the society's present plans to provide for the great expansion and diversification that is now taking place in the refrigeration industry. The industry is growing fast and the society is being geared to expand, grow and serve the needs of the next fifty years. The national secretary, M. C. Turpin called attention to the 48th Annual Meeting in New York from November 30 to December 3. Dr. D. K. Tressler, national treasurer and assistant secretary Alfred Chadburn were also present. One foreign guest of the Centennial of Engineering, Mr. Julio Goncalves, Director of the Brazilian Department of Agriculture located at Recipe, Brazil, also attended the meeting. He has been a full member of ASRE since 1934.

The speaker of the evening was John M. Bickel, sales manager of the dealer division of Carrier Corporation, Syracuse, N. Y., who talked on the history and developing of air conditioning, 1902-1952.

The 50th anniversary of air conditioning, he said, would not be so glamorous were it not for the brilliant work of Dr. Willis Carrier. In 1902 Dr. Willis Carrier installed the first scientific air conditioning system to control paper shrinkage in a Brooklyn lithographing plant so that multi-colored magazines could be printed with multi-colors in proper register.

Dr. Carrier's most important achievement to scientific air conditioning rests on his discovery of the laws governing the physical properties of air. These formulae have not been changed, even after 50 years, and they are still the basis for all fundamental calculations in the industry. These formulae were published in 1911.

The idea behind dew point control came to Dr. Carrier while he faced a fog-shrouded railroad platform in Pittsburg. He realized that the fog was actually made up of tiny drops of water, water that had been condensed out of completely saturated air by virtue of the low prevailing temperature.

Revolutionary new equipment resulted. He patented and proved that water could be taken out of air by using water—water below the dew point of the air cooled by mechanical refrigeration. The use of spray water for humidifying was readily accepted. Broad-scale industrial air conditioning systems were now possible and developed rapidly using double duty spray type units which both humidified and dehumidified the atmosphere, using warm water for the first job and cool water for the later.

The broad development of air conditioning and its many benefits in all phases of our industrial and social life has received its early start nearly fifty years ago by the brilliant work of Dr. Carrier in his discovery of the laws governing the physical properties of air. He also pioneered the industrial applications and commercial development of the business to its present stature of today. The next great frontier for air conditioning, he said, is closer to home; it is, in fact, in the home. The time is coming when man will no more permit his family to suffer from the heat than he now permits them to suffer from the cold.

Big Attendance

The ASRE centennial meeting was a record breaking affair. One hundred two members and guests were present. The young engineers also took advantage of this opportunity. Bob Miller of Westerlin and Campbell Company thoroughly discussed the history and development of refrigeration injection. Interest was high and he was kept busy by a large group answering questions on the control of refrigerants by different types of ammonia injection. The differences in results in evaporator performance was explained between hand valve operation, automatic expansion valves, constant pressure expansion valves and the thermostatic expansion valve.

This meeting was of very definite value to young engineers for they obtained specific information from an experienced man on how to apply expansion valves of various types and where they should be used as well as where they will not perform.

Program to Standardize Refrigeration Equipment

A PROGRAM to standardize components of refrigeration and air conditioning equipment used by the Department of Defense has been undertaken by the Defense Supply Management Agency of the Department of Defense with the support of the refrigeration industry.

A Munitions Board Industry Advisory Committee, composed of representatives of eleven manufacturers of such equipment selected to reflect a cross-section of the industry by size of company, is collecting data necessary to complete the work. A subcommittee is considering the particular problem of compressors.

The committee will develop plans for reducing the number of types of refrigeration and air conditioning units used by the three military departments to attain the maximum practicable interchangeability of parts and components.

Ultimate objective of the standardization effort is to simplify spare parts supply and maintenance in order to increase efficiency and effectiveness of military supporting services to combat areas.

Members of the main committee are: Donald French, Carrier Corporation; B. S. Booher, General Motors Corporation; L. W. Larsen, Tecumseh Products Company. R. F. Lauer, York Corporation; J. L. Ditzler, Westinghouse Corporation; C. L. Coulter, Lehigh Manufacturing Company; Clyde Ploeger, Servel, Incorporated; S. D. Loveley, Chrysler Corporation; Oscar Buschman, Copeland Refrigeration Corporation; Frank Hawk, Brunner Manufacturing Company; and K. A. Gould, General Machine and Manufacturing Company.

Rear Admiral J. W. Fowler, USN, (Ret), Director of the Defense Supply Management Agency, is Chairman; Nathan Brodsky, Deputy Director of the Defense Supply Management Agency, is Deputy Chairman, and Kenneth A. Simmons, Office of Standardization, Defense Supply Management gency, is government liaison representative of the Committee.

Odor Removal

RECENTLY a member asked for information on how to remove the odor of herring pickle that had leaked from barrels and had contaminated the floor and, in fact, had leaked on barrels of berries in a room below. Smoke odor (in cast of fire) is another hazard. Odors of various kinds are hazards, for example the resins now being cold-stored in some areas. James Kuhn at the last annual meeting, called attention to the fact that a little leakage of barrels containing resin will cause an odor problem. Odors of wood and many product odors are being successfully combated with activated-coconut-carbon filters (Puraire, Dores or similar) but there is need for specific methods for quick removal of accidental sources of odors—ways to clean them out and nullify their harmful effects.

Again we have some answers. Andy Anderson, Port of Seattle, Seattle, Wash. says that the use of Casklor (made by Casklor Sprayer Co., 6518 Ravenna Ave., Seattle) has proved effective in removal of fish odor in his experience, and that it kills molds and bleaches stains satisfactorily. Jack Urban of Los Angeles Cold Storage Co. has used dry ice successfully for contamination with ammonia and suggests that it be effective for other odor contamination. Edward Hathaway of Commonwealth Ice & Cold Storage Co., Boston, uses ozone to combat fishy odors and has confirmed a previous report that No-O-Odor (made by Diamond Chemical Co., 107 Derring Road, Boston 26, Mass.) is used on Boston fish piers to remove fish odors. A product and method of treatment called "irkem," (Airkem Inc., 241 East 44th. St., New York City) is claimed to be effective in removal of smoke after fires.—TRRF Information Bulletin.

CONVENTION CALENDAR

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
November 30-December 3, 1952
Commodore Hotel, New York, N. Y.
M. T. TURPIN, Secretary

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 11-14, 1952
Netherland Plaza Hotel, Cincinnati
GUY W. JACOBS, Exec.-secy.

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 12-14, 1952
Adolphus Hotel, Dallas, Tex.
J. RICHARD KELAHAN, Secretary

DELTA STATES ICE ASSOCIATION
November 23-25, 1952
Hotel Heidelberg, Jackson, Miss.
R. N. MILLING, Secretary

MISSOURI VALLEY ICE MANUFACTURERS' ASSOCIATION
January 12-13, 1953
Hotel President, Kansas City, Mo.
V. R. ESPHORST, Secy.-treas.

GEORGIA ICE MANUFACTURERS ASSOCIATION
February 24-25, 1953
Ansley Hotel, Atlanta, Ga.
RICHARD H. FLORRID, Secretary

SOUTHERN ICE EXCHANGE
February 24-25, 1953
Ansley Hotel, Atlanta, Ga.
RICHARD H. FLORRID, Secretary

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
March 25-27, 1953
Empress Hotel, Victoria, B. C.
L. F. MARSH, Exec.-secy.

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Diamond Ice & Coal Co., Charleston, W. Va.

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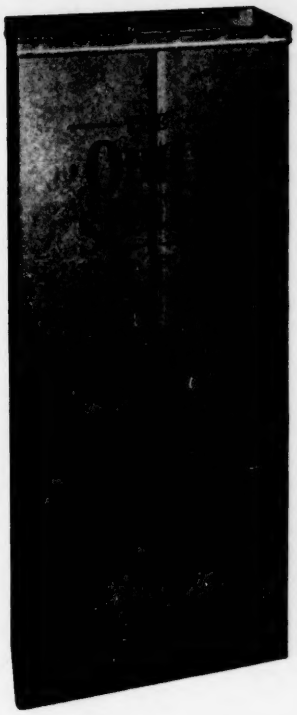
Paul F. Hoff, Secretary
1300 East Locust St., Milwaukee, Wis.



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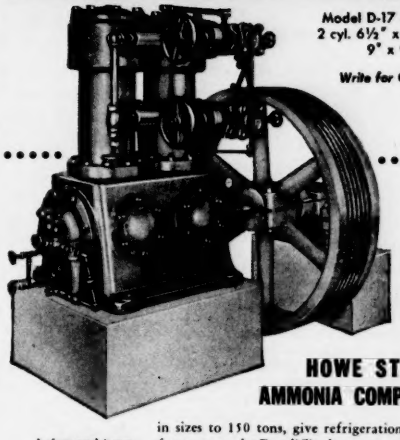

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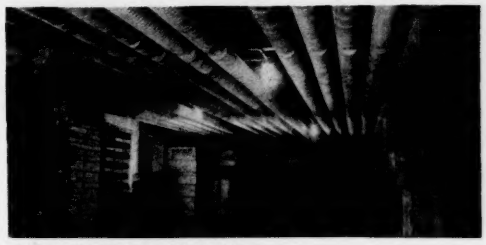
in sizes to 150 tons, give refrigeration that's exact for your needs. For difficult two-temperature jobs, use HOWE "ME" Compressors. You save on first cost, power, installation and maintenance.



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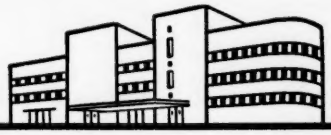
NEW PLANTS and  IMPROVEMENTS

This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

Arizona

Phoenix, Ariz.—The Crystal Ice & Cold Storage Co. has completed a new one story freezer plant of 166,000 cubic feet.

California

Pixley, Calif.—Bill Masters has indicated plans to build a $6,000 cold storage unit.

Visalia, Calif.—The Alta Meat Co. has permit for construction of a $3,700 addition to its present cold storage facilities.

Illinois

Chicago, Ill.—Carrier Corp. has been awarded contract to air condition an additional 400,000 square feet of the Merchandise Mart.

Washington, D. C.

Washington, D. C.—The Terminal Refrigerating & Warehousing Corp. is converting most of its cooler space over to freezers, an outgrowth of increasing demands for lower and lower storage temperatures. In 1939, practically 80 per cent of Terminal's entire warehouse space consisted of cooler storage rooms. Now, 75 per cent of the approximately two-million cubic-foot storage capacity is devoted to freezer space, and the conversion program is not yet completed.

Louisiana

New Orleans, La.—The New Orleans Cold Storage & Warehouse Co. has converted 90,000 cubic feet of cooler to freezer space, providing storage space for an additional two million pounds of frozen foods.

Massachusetts

Springfield, Mass. — The Pioneer Valley Refrigerated Warehouse is adding 500,000 cubic feet of freezer space.

Woburn, Mass.—Borden Co. plans to build a new ice cream plant with a production capacity of more than a million gallons a year. Construction work will start immediately and completion is scheduled for May 1, 1953. The one-story steel and brick building will be about 175 by 320 feet, providing about 44,000 square feet of floor space.

Missouri

Kansas City, Mo.—The Midwest Cold Storage and Ice Corporation, Kansas City, is constructing a new building containing about 8,200 square feet of floor space. The plant will cost $125,000 and is scheduled for completion in early fall. The new structure is to replace five buildings in a 17-building layout.

New Jersey

Glassboro, N. J.—The Glassboro Cold Storage Corp. is connecting two cooler rooms to freezers to give the plant a capacity of 7 million pounds of frozen foods.

New York

Red Hook, N. Y.—The Red Hook Cold Storage Company has expanded its refrigerated storage of apples with an additional 150 ft. long and 60 ft. wide, with four individual rooms, each with a capacity of 12,000 boxes of apples.

Oregon

Portland, Ore.—The Sheridan Fruit Company has expanded its operations and remodeled buildings to install a cooler with capacity of two freight carloads.

Pennsylvania

Philadelphia, Pa.—The Frankford Arsenal has awarded contract for installation of environmental test equipment to Tenney Engineering Inc., Newark, N. J. Totaling nearly half a million dollars the contract calls for a cold room, a humidity chamber and a desert room. The equipment will be used to test equipment for the armed forces.

Rhode Island

Newport, R. I.—The Naval Supply Depot, U. S. Government Navy Dept., plans to build a cold storage plant to cost an estimated $1,406,000.

Virginia

Richmond, Va. — The Richmond Cold Storage Co. has converted two cooler rooms to freezers, providing 90,000 additional cubic feet of freezer space.

Newport News, Va.—Carrier Corp. has been awarded contract for complete air conditioning and refrigeration of the Aircraft carrier U.S.S. Forrestal.

Wisconsin

Madison, Wis.—The Central Storage & Warehouse Co. plans to double its present space.

Sales and Reorganizations

Yuba City, Calif.—The California Utilities Commission has granted permission to the Yuba City Refrigeration Company to purchase a 100 x 100 foot warehouse from the Yuba City branch of the California Canning Peach Association. The purchase price of the building, leased by the refrigeration firm from the Peach Association since 1946, was $126,000.

Delcambre, La. — The Delcambre ice plant has been sold by the Central Louisiana Electric Co. to Isadore Delcambre of Delcambre, for $61,000. The plant sells ice to a number of shrimp processors.

Red Creek, N. Y.—Edward McGowan of Marlboro, N. Y., has purchased the Red Creek Cold Storage subject to the approval of stockholders. The plant was built in 1911.

Philadelphia, Pa.—A two-story ice plant building, corner of Ninth and Washington avenue, containing 25,000 square feet of space, has been sold by the American Ice Company to Paul Giordano, Leonard Abramson, and others for $210,000. The American Ice Company is transferring its operations to two other plants at 12th and Washington and 17th and Washington.

Memphis, Tenn.—The old Crystal Ice plant has been purchased by Manufacturers Rubber & Supply Co. which will remodel the building for use as a manufacturing plant.

Icy Items

Opelousas, La.—Notice of dissolution has been filed by The Kemper Ice Co., Inc.

Geary, Okla.—The Geary Ice Plant has been closed permanently according to G. A. Gritchfield, the owner. The plant started operating in 1922.

Fire and Accident Record

Sunnyside, Wash. — An explosion and fire at the Washington Cooperative Building caused between $400,000 and $500,000 damage. The cold storage room in the not-yet-completed building was destroyed.

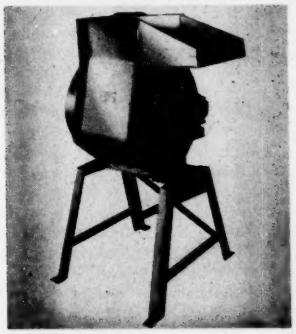
New Incorporations

Menands, N. Y.—Freezeway Food Club, Inc., manufacture freezers and refrigerators, and have been granted a charter of incorporation, listing capital stock of $10,000. Directors: Madelyn Goulette, Albany, N. Y.; Daniel H. Mahoney, Albany, N. Y.; and Milton M. Schiller, Brooklyn, N. Y.

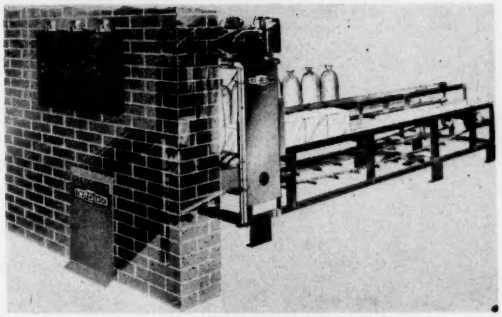
New York, N. Y.—New York Food Club, Inc., cold storage, refrigeration and ice making business, has been granted charter of incorporation, listing capital stock of 200 shares of no par value.

NOW IS THE BEST TIME

TO PLACE YOUR ORDER



MATHIESON ICE CRUSHER



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INDEX THE GREATEST NAME IN SUPPLIES

DEATHS

W. C. Spafford

THE DEATH of W. C. Spafford, president and manager of the Manufactured Ice Company, Bloomington, Ill., until his retirement in 1943 occurred at the Brokaw Hospital, Normal, September 27.

Mr. Spafford was a graduate of Weslyan University. He worked for the Beich Candy Company prior to the time he took over management of the Manufactured Ice Company in 1919. He was president and manager of the company until 1943, when he retired. He was a past president of the Illinois Association of Ice Industries having served in 1925. He was interested and active in the affairs of the ice industry and its associations and made many friends in those circles. He also was active in the civic affairs of Bloomington and in the Rotary Club.

Surviving is one brother, Ralph, of Burbank, Calif.

Floyd Tyler

THE DEATH of Floyd Tyler, a pioneer business leader of Richmond, Va., occurred August 13. He was 81. Mr. Tyler was a native of Richmond. He started in the ice business by establishing the Tyler Ice Company about 60 years ago. He was a member of the Tyler family which numbered President John Tyler among its distinguished members. He was a charter member of the Richmond Chamber of Commerce, a member of the Cosmopolitan Club and of the Royal Arcanum. Survivors include his widow, Mrs. Anna Ryan Tyler and two daughters.

D. H. SHARPLEY, owner and operator of the Hartselle Ice and Coal Company, Hartselle, Alabama, died at his home September 17. He was 80. Mr. Sharpley was an active worker in the First Christian Church and a widely known Hartselle business man. Survivors include his widow, Mrs. Cora Sharpley, a son, and three daughters.

CORNELIUS REID, colored ice man of Nacogdoches, Texas, died from the effects of a bee sting. While delivering a piece of ice a bee flew from a bush and stung him. Upon reaching his truck he collapsed. Members of his family said he was allergic to bee stings.

CHARLES BINGLEY CARSWELL, formerly operator of a 10-ton ice plant in Terrell, Tex., died recently at his home in Dallas. He was a member of the First Baptist Church. He is survived by his widow, Mrs. Clara Tumlin Carswell, and a son, Howard Bingley Carswell.

Andrew E. Holmes

AN ADVERTISING man, well known to many of the leading ice men of the nation, Andrew E. Holmes, died recently at his home in Scarsdale, N. Y. "Andy" was well known to members of the ice industry as contact man for Donahue & Coe, which handled National Ice Advertising. When he retired from Donahue & Coe he became president of Angostura-Wipperman, makers of Angustora Bitters, and later was head of a pharmaceutical concern in New York. Previously he had been with several advertising agencies, including N. W. Ayer. He had been retired for some years. He is survived by his widow, a daughter, and a grandchild.

Damas Andrew Moresi

THE death of Damas Andrew Moresi, Sr., Opelousas, La., occurred at his home October 8. He was 84.

Mr. Moresi was a native of Jeanerette and a resident of Opelousas for 63 years. In 1889 he opened the Opelousas Ice Company, the first ice plant in the city. He was a vice-president of the Planters Trust and Savings Bank of Opelousas and president of A. Moresi and Company of Jeanerette, a foundry. He was a member of the Opelousas Commandery Knights Templer, and of the Opelousas Woodmen of The World and also of the Jerusalem Shriners in Shreveport.

Survivors include his wife, Mrs. Clementine Chachere Moresi and a son, Andrew, Jr.

B. T. GIDDENS, Knoxville, Tenn., founder of the B. T. Ice Company, died October 10 at his home in Fountain City. He was 68. A native of Cumberland County, Mr. Gidden came to Knoxville as a young man and was in the ice business for many years. He is survived by his widow, two sons and three daughters.

WOODROW W. MATTHEWS, manager of the Utica Ice & Cold Storage Company, Utica, Miss., for almost 23 years, died of a heart attack July 27. Mr. Matthews, who was 40 years old, was born and raised in Utica. Surviving are his widow and two sons.

CORNELIUS R. SPRINGER, who had operated an ice business for many years in Alexandria Bay, N.Y., died August 30. He was 85. Mr. Springer conducted the ice business for about 25 years until his retirement several years ago.

LEONARD C. WHEATLEY, Walnut Hills, Cincinnati, who delivered ice for the Avondale Ice Company for more than forty years died September 19. He was a member of the Oola Khan Grotto. Surviving are his widow, Mrs. Carrie Wheatley, and a sister.

Joe B. White

THE death of Joe B. White, president of the Fayette Ice Company, Fayette, Miss. and the Home Ice Company, Woodville, Miss., occurred October 3. He was 44.

Mr. White was a well known business man and civic leader of Fayette, member of the Fayette Baptist church, Worshipful Master of the Fayette Masonic lodge, a member of the Washabi Shrine Temple at Jackson, and the Natchez Shrine Club, a member of the Fayette Lions Club and member of the board of directors of the Delta States Ice Association.

Survivors include his widow, Mrs. Inez Little White, three daughters and four sisters.

THOMAS CRUTHERS, vice-president of Worthington Corporation since 1936, died at his home in West Orange, N. J., July 27. A graduate of Stevens Institute of Technology, Mr. Cruthers joined Worthington in 1907, in charge of the gas engine field erection department. He then held successive positions as sales engineer, assistant sales manager, and sales manager in the company's New York office. Later he became assistant general sales manager and assistant vice-president in the general sales department. He was a member of the Heat Exchange Institute, a member of the board of governors of NEMA and belonged to a number of engineering associations, including the American Society of Refrigerating Engineers.

KENNETH D. KINNEY, employed as a salesman for the Crystal Ice Co., Phoenix, Ariz., for 14 years, died September 8. He was 43 and had been in ill health since 1943 from service-incurred disabilities received during World War II. Born in Robstown, Texas, Mr. Kinney came to Phoenix in 1920 from Fort Worth. He was a member of Luke-Greenway Post American Legion. Surviving is his widow, Mrs. Eva Kinney.

CLARENCE C. TEBBETTS, former owner and operator of the North Louisiana Ice Company, Minden, La. died in Oswego, N. Y., after a long illness. He was 68. He is survived by his widow, Mrs. Dollie Birket Tebbetts, four sons, two daughters and 15 grandchildren.

AUBREY S. DUCLOS, owner and founder of the Edmonton Cold Storage Company, Ltd., Edmonton, Alberta, Canada, died August 12, at the age of 71. A pioneer in the frozen food locker field, he rented lockers in his plant to individual customers more than 30 years ago. He was a member of the American Society of Refrigerating Engineers.

Giant Reefer Joins Fleet

ANOTHER "Reefer" joined the fleet when USS Aludra (AF 55) was commissioned at the Philadelphia Naval Base, Pa. It is one of the largest of the Navy's refrigerated stores ships.

Transferred from the Maritime Administration to the Navy, the former SS Matchless was selected for adaptation to Navy purposes and sent to an east coast shipbuilding company for remodeling. A completely new refrigeration plant was installed, holds were rearranged and new insulation was put in the cargo spaces. Additional living space was provided for officers and crew.

Measuring 460 feet in length with a displacement of 14,150 tons, Aludra will provide 227,470 cubic feet of refrigerated space for all types of Navy chilled and frozen provisions. The ship will be used for transferring stores to other ships and advanced bases.

Keeping our fighting ships and supply points in the forward areas well stocked takes a lot of doing. The types of Navy ships that do most of the doing are these stores or refrigerator ships, or "reefers" as they are called.

Reefer ships themselves have long been familiar to the Navy. They really came into prominence, however, during World War II along with the development of the "quick freezing" process of preserving foods. Today, reefers like Aludra are transporting tons of fresh fruit, vegetables and meat as well as staples such as sugar and flour to our forces overseas. — All Hands.

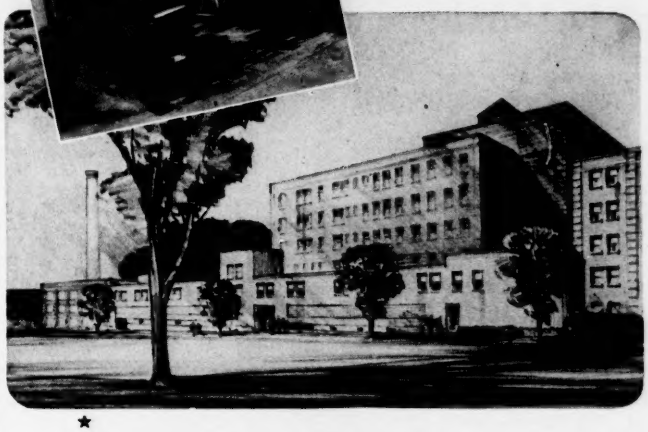
Beef Supply To Be Larger

FORECASTERS predict that there will be more beef to sell (and store) in the next twelve months. The United States Department of Agriculture bases its prediction on the expected import of 500,000 head of Mexican cattle as a result of the lifting of the embargo, which was placed in 1948, to keep hoof-and-mouth disease from spreading through the U. S.

Also, the American Meat Institute reports the U. S. will have the largest supply of beef in history during 1953 if producers continue to build up cattle herds as they have during the first half of the current year. "The nation's cattle population," the Institute says, "may increase to a record 92 to 93 million head by the end of 1952. An increase of six million head during 1951 raised cattle members to record 88 million head on January 1, 1952."

It's VILTER Again

in the new MILWAUKEE HOSPITAL addition



Long famed as one of Milwaukee's foremost private hospitals, Milwaukee Hospital recently completed a new wing that considerably broadens its program of hospital care for the people of the community. As it does in all modern hospitals, air conditioning played an important part in the expansion of Milwaukee Hospital.

Installed in the new wing, and supplementing other Vilter equipment, were two new Vilter 4-cylinder VMC Freon compressors, a shell and tube Freon condenser and receiver, and two Vilter air conditioning coils. The 40-ton Vilter compressors are provided with automatic capacity reduction to compensate for varying load conditions.

Hospitals know the importance of refrigeration and air conditioning that can be counted on—lives may depend on it. Industry as well must have cooling that is dependable day after day and year after year. Whether it is patient or product that needs care, Vilter refrigeration and air conditioning has a years-old record for staying on the job—and for doing it at consistently lower operating and maintenance costs. Vilter can save money dependably in *your* plant, too.

WRITE TODAY FOR BULLETINS 110, 120, AND 220

Vilter

Your nearby Vilter Distributor or Representative will be glad to show you how you can save money—now and for years to come—with Vilter Refrigeration.

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, MILWAUKEE 7, WIS.

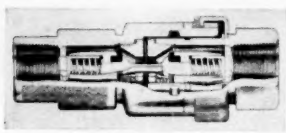
Ammonia and Freon Compressors • Pakicers • Evaporative and Shell Tube Condensers
Pipe Coils • Valves and Fittings • Air Conditioning

What's New

MACHINERY
APPLIANCES • PROCESSES

Shut-off Valved Coupler

A MAKE and break double shut-off valved coupler has been designed and introduced by Henry Valve Co. Built originally for either ammonia



Shut-off Valved Coupler designed by Henry Valve

or Freon refrigerants in connection with refrigerated trucks, the coupler also has industrial applications wherever pneumatic or hydraulic lines are involved.

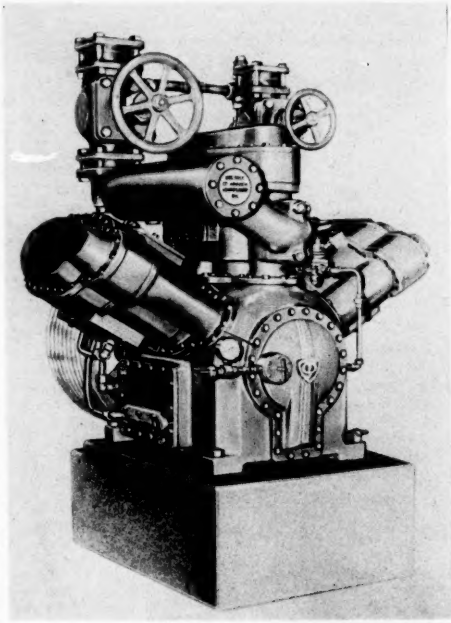
As the two halves of the unit are coupled together, the two piston valves open by moving away from their respective seats. A soft molded insert, mechanically held in place, forms the seat in each half of the coupler. True alignment of pistons is insured by long guides. Pistons can be readily replaced after long service, if necessary, by unscrewing seat bushings. An "O" ring in socket half provides positive seal while coupling is connected. Protector caps are provided for covering coupler halves when disconnected. Available in ½ inch F.P.T. connections. Complete information can be obtained by writing to Henry Valve Co., 3215 North Avenue, Melrose Park, Illinois.

Creamery Package Shows Multi-Cylinder Compressor

VISITORS to the Dairy Industries Exposition in Chicago September 22 to 27 witnessed the first showing of a new ammonia compressor of up to 200 tons capacity manufactured by The Creamery Package Mfg. Company of Chicago. The new model is called the 6H Type "K" Ammonia Compressor, and is the largest of CP's Type "K" Multi-Cylinder Compressors.

The 6H is compact in design and requires no more floor space than many lower capacity compressors. It incorporates all the features of other CP Type "K" compressors, including full water-jacketed cylinders, water-cooled seal bearing, oil cooler, forced-feed lubrication, automatic capacity control, unloaded starting and CP shaft seal.

The 6H is a 6 cylinder, 6¾ x 5 compressor. At 20 pounds suction line pressure and 155 pounds condenser pressure, it produces over 108 tons of refrigeration; with suction pressure at 45 pounds, it will produce 209 tons. It is sturdily built and engineered for years of top efficiency service. Descriptive Bulletin is available from The Creamery Package Mfg. Company, 1243 W. Washington Blvd., Chicago 6, Ill.



CP Type "K" multi-cylinder ammonia compressor Model 6H-6 cylinder, 6¾ x 5 with refrigeration capacities of: 108 tons at 20 lbs. suction line pressure and 155 lbs. condenser pressure; 209 tons at 45 lbs. suction pressure.

Test Gauge Verifies Pressure Instruments

A PERIODIC check of pressure instruments with a reliable test gauge has been known, in many instances, to save process fluid or otherwise reduce operating costs in amounts many times the cost of the test device. Such an instrument is the 6-inch Model P Test Gauge, made by The Foxboro Company, Foxboro, Mass. This inexpensive gauge not only serves in checking pressure controllers, recorders and indicators, but also furnishes a standard of accuracy for calibrating other pressure testing equipment in the instrument department.

Six-inch Model P Test Gauges with leather carrying case. Two ranges shown are 0-100 psig and 0-1000 psig.

The gauge is furnished in ranges of 0-30 Hg vac. up to 0-10,000 psig, and guaranteed accurate within ½ of 1 per cent of the total scale at any point throughout its range. Suitable tapered pipe male thread connections are provided.

Construction is of specially selected materials. The case is cast aluminum, threaded to receive a brass ring which is finished to match the case. The measuring element is a full 270° Bourdon spring of steel or beryllium copper. The movement consists of a chrome-plated steel pinion, segment and arbor, monel plates and a stainless steel hairspring. A stainless steel micrometer-adjusted pointer facilitates precision measurements on an easy-to-read dial. A durable leather carrying case, with shoulder strap, is optional.

The complete series of indicating gauges and accessories is described in Foxboro Bulletin 424, copies of which will be sent on request.

Tenney Offers Temperature Humidity Test Chambers

TO SUPPLY industry with a standard line of environmental test chambers for conducting temperature-humidity tests, Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J. has standardized on five basic chamber types. This standardization permits purchasers to select chambers from existing specifications and eliminates the extra cost of custom built models. These chambers automatically maintain humidity from 20 to 95 percent through a temperature range of 35 to 185 F. Minimum dew point is 33 F.

The chambers, known as the Tenney TH Series, come with the following inside dimensions: (1) 22x19x48 inches, (2) 42x18x48 inches, (3) 36x31x36 inches, (4) 42x24x48 inches, and 48x24x48 inches. Models 1 and 3 have one door; the others have two. Common to all models are accurately calibrated indicating thermostatic controllers, air circulating blowers for uniform movement of air, and stainless steel interior and exterior paneling.

Four types of control are incorporated in the Tenney TH Chambers—constant humidity, constant temperature; constant humidity, varying temperature; varying humidity, constant temperature; and varying humidity and varying temperature.

Alumiseal Tests

HEAT flow tests on the C. T. Hogan & Co. Alumiseal insulation in the plant and warehouse of Standard Brands, Inc., Philadelphia, Pa., showed that after four years of continuous operation the efficiency of operation and construction of the Hogan units was the same as at the time of installation.

In a recent report to James Macormack, vice-president and general manager of C. T. Hogan, Edward Simons, consulting engineer of San Francisco said, "There is no question but that this is an excellent installation, well designed, well-constructed, and with an exterior vapor barrier adequately balanced against the interior Alumiseal liner."

Actually, C. T. Hogan equipment has been found consistently to operate for fewer hours of running time than called for instructural designs. Mr. Simons' tests showed that the actual Alumiseal insulation value is greater than the published insulation value, due to the measures of safety employed by C. T. Hogan in tabulating their published heat transfer values from laboratory tests.

Mr. Simons, president of the American Society of Refrigerating Engineers, is the leading authority in the country on the development and technique of the use of the heat meter for testing efficiency of insulation construction after installation. Using his

Five of the Finest!

Here you see just four compressors and a CP Ice Builder. But in the complete CP compressor line you'll find everything from 1½ ton capacity verticals up to the new compact CP Type "K" 6H Multi-Cylinder, with a capacity of up to 200 tons!

With a range so broad, it's only natural that CP can provide the unit that's *best* for you, *whatever* your need.

And no matter what the capacity or type—whether vertical or multi-cylinder, single stage or booster system—you'll get the dependable, economical operation that comes from CP design and engineering. You'll get the benefit of CP's more than 60 years of refrigeration leadership, *plus CP Job-Engineering* that matches performance to needs.

Good enough reasons why, for anything in refrigeration, your best move is to see CP—*first!*

(ABOVE)

As Seen at the
DAIRY INDUSTRIES EXPOSITION

From left to right: Type "K" 6 Cyl., 5 x 3½ Booster Compressor ... 20 HP Ammonia Condensing Unit with 2 Cyl., 5 x 5 Compressor ... Type "K" Ammonia Compressor, 4 Cyl., 3½ x 3½ ... new Type "K" 6H Compressor, 6 Cyl., 6¾ x 5 with capacity up to 200 tons. *Background, center:* CP Compact Ice Builder, 2000 lb. capacity.

FOR OVER 60 YEARS
REFRIGERATION DEPENDABLE

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own techniques, he tested the Alumiseal installation to ascertain the in-place conductances of the reflective insulation installations which had been in continuous operation since 1948.

The results of the actual test measurements of heat flow across the reflective spaces together with various components of complementary heat transfer analysis with respect to panel structure indicate that the conductances of the Alumiseal insulation as installed are less than those indicated by the standard curves of C. T. Hogan & Co., Inc., dated June 16, 1948. Horizontal heat flow through the vertical walls was five per cent less than the curves indicate. At no time during the test did any condensation appear on the exterior Alumiseal sheets.

Mr. Simons reported that tests were made during a week-end and holiday period in which the activity of the plant and warehouse was at a minmum, thus allowing excellent test conditions. Heat flow was measured by a specially equipped Brown portable pyrometer balancing through a custom-built electronic galvanometer which has been developed for this work.

Asphalt Product for Cold Insulation

"LAYKOLD For Cold Insulation Construction" is the title of a new eight-page, two-color booklet issued by the American Bitumuls & Asphalt Company, for use by insulation contractors, architects, insulation manufacturers and building owners. With detailed charts, photographs and tables plus complete, easy-to-read descriptive material, the booklet provides valuable data on typical applications of Laykold Insulation Adhesive, Laykold Cement and Laykold Weathercoat. These asphaltic products are applied cold—eliminating the expense of costly heating equipment —with spray, broom or trowel. The booklet is available from the American Bitumuls & Asphalt Company, 200 Bush Street, San Francisco 4, Cal.

Concrete Hardener Stops Floor Sanding

A FLUSH-ON preparation which adds life to a concrete floor is provided by Flintcrust Liquid. It is to be used on floors that receive rough traffic, and is reputed to end sanding and dusting. Under a microscope a concrete surface consists of numerous tiny hills and valleys which break down under traffic, causing sanding. This material case-hardens the surface, sealing and binding the concrete into a tough surface. Resistance to penetration of acids, grease, oil and water. For particulars write Flexrock Co., 3678 Filbert St., Philadelphia, Pa.

MANUFACTURERS' NEWS

York Engineers Advanced

YORK CORP. announces that a number of their research and development engineers have been elevated to newly created positions of engineering managers in a move to streamline the development of new air conditioning and refrigeration products. The new engineering managers and the products under their supervision are:

S. B. Nissley, reciprocating compressors;

R. D. Blum, central station air conditioning;

R. A. Chadburn, heat exchange equipment;

J. H. Anderson, turbo compressors;

S. P. Soling, engineered applications;

P. B. Moore, single room air conditioners;

A. E. Diehl, self-contained air conditioners;

H. A. Brysselbout, Ice Makers;

P. G. Thayer, hermetic compressors;

Rodney F. Lauer continues as vice-president in charge of engineering and research with J. C. Conley as chief engineer.

B. E. James, formerly a vice-president with McQuay, Inc., has been named assistant chief engineer in charge of packaged products and the smaller systems sold through distributors and manufacturers.

J. R. Chamberlain is assistant chief engineer in charge of industrial products sold through the firm's direct sales outlets.

F. J. Allen has been appointed manager of the corporation's engineering and chemical laboratories.

J. P. Hare continues as chief draftsman.

New Vending Equipment

THE following companies have installed S & S ice vending equipment:

Ebner Ice & Cold Storage Co., Vincennes, Ind.

J. E. Parker & Co., Eaton, Ohio.

Anderson Ice & Fuel Co., Richmond, Ind.

Arctic Ice Co., Ltd., Brantford, Canada.

Pen-Shade Co., Indianapolis, Ind.

Liebman Ice Co., Wewoka, Okla.

Shera Coal & Oil Co., Richmond, Ind.

Ebner Ice & Cold Storage Co., Seymore, Ind.

Ebner Ice & Cold Storage Co., Flora, Ill.

Ebner Ice & Cold Storage Co., Olney, Ill.

American Arctic Ice Co., Oklahoma City, Okla.

Mockler New Manager Index Coupon & Supply

THE Index Coupon & Supply Company announces that Edward L. Mockler, Jr., assumed the position of general manager of the company,

Edward L. Mockler Jr.

July 1. Mr. Mockler has spent several years in the ice industry. He is a graduate of the National Ice Marketing Institute and was recently employed by City Products Corporation as assistant merchandising manager.

Thomas New District Mgr. Cork Insulation Co.

THE appointment of Arthur E. Thomas as district manager of the St. Louis Branch, Cork Insulation Company, Inc., Wilmington, Del., has been announced. Mr. Thomas is a member of NAPRE and was recently affiliated with the San Francisco branch of the same firm.

Arthur E. Thomas

He interrupted his college training to take his flight training at Pensacola, Florida and was commissioned as second lieutenant of the United States Marine Corps. Reserve as a pilot.

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*

★ *Saves Weight*

★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT

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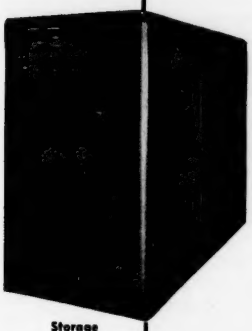
DETROIT ICE MACHINE COMPANY

2615 Twelfth St., Detroit 16, Mich.

DIMCO Evaporators in a Frozen Food Storage Room at Great Lakes Terminal Warehouse, Toledo, Ohio. A typical installation facilitating palletizing.

Belt Capacity 40 Ten-pound



Storage for 200 Ten-pound Bags

This vendor is a money maker

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The New POLAR Cubed and Crushed ICE VENDING STATION

$

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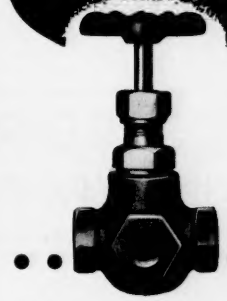
SHANK REFRIGERATION PRODUCTS

TOP CONSTRUCTION!

3-WAY DUAL SHUT-OFF VALVE

For use where Refrigeration Codes require dual relief valve installations. Stainless steel stem. Indicator plate on hand wheel shows position of valve shut off. Completely rust-proofed.



RELIEF VALVES

For Ammonia and Freon. One piece body design—rustproof finish. Internal construction—stainless steel—will not corrode. Positive relief action. Pressures from 75 to 400 lbs.

See your jobber—or write us for prices.

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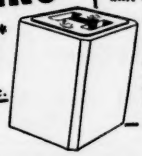

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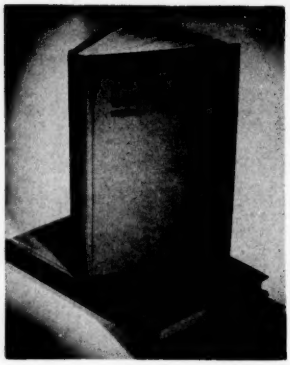

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Western Insulator Changes Name

WEST Fibre Glass Supply Company, San Francisco, has changed its name to Western Fibrous Glass Products Company, it was announced in October by C. F. Leighton, president. The change in name which was effective October 1, is to better describe the scope of activities of the firm and does not reflect any reorganization. The company has extended its line as a field representative of National Manufacturers of Electrical and Thermo Insulations and Associated Products. The firm has warehouses and offices in Los Angeles, San Francisco and Seattle.

Pounds New Controller For Booth Fisheries

HARRY E. POUNDS has been appointed to the newly created position of Controller for Booth Fisheries Corp. and its domestic and Canadian subsidiaries, C. A. Linder, vice-president and treasurer has announced. Mr. Pounds was formerly associated with the accounting firm of Peat, Marwick, Mitchell & Co., as a member of their management controls division. Prior to that he was with A. T. Kearney & Co. Mr. Linder said that Mr. Pounds will be in complete charge of the company's overall accounting policies.

Cox Joins Owens-Corning Manager Insulation Sales

APPOINTMENT of Allan W. Cox as manager of low temperature insulation sales for Owens-Corning Fiberglas Corporation has been announced by Edward J. Detgen, general sales manager of the company's General Products Division. Mr. Cox, with offices in the company's headquarters at Toledo, Ohio, will coordinate all sales activities relating to the use of Fiberglas low temperature insulations in cold storage facilities, including frozen food lockers, warehouses and areas storing meat and other perishable items, and for certain industrial applications. Associated for more than 16 years with the Cork Insulation Co., Inc., he has a broad background in the cold storage field, including eight years experience in sales of Fiberglas insulations.

Allan W. Cox

Statement of Ownership and Management
of
ICE AND REFRIGERATION
for October 1, 1952

The following is a statement of ownership, management, etc., as required by the act of Congress of August 24, 1912, as amended by the acts of March 3, 1933 and July 2, 1946 (Title 39, United States Code, Section 233) of ICE AND REFRIGERATION, published monthly at Chicago, Ill., for October 1, 1952.

1. The names and addresses of the publisher, editor, managing editor, and business manager are:
Publisher, Nickerson & Collins Co., Chicago, Illinois.
Editor, H. T. McDermott, Elmhurst, Illinois.
Managing Editor, E. R. Curry, Chicago, Illinois.
Business Manager, L. R. Townsley, Chicago, Illinois.

2. The owner is (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) Nickerson & Collins Co., 435 N. Waller Ave., Chicago 44, Illinois. Stockholders: H. T. McDermott, Elmhurst, Illinois; H. T. Curtis, Chicago, Illinois; L. R. Townsley, Chicago, Illinois.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

H. T. McDERMOTT, Editor

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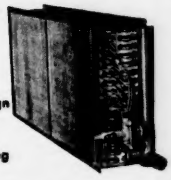

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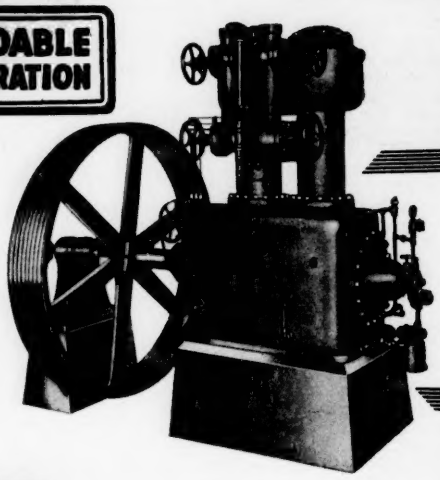

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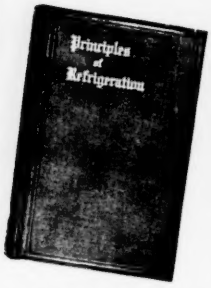

PRINCIPLES OF REFRIGERATION, 3rd Edition (1947) revised by Wm. H. Motz, provides information and data for the practicing refrigeration engineer. Of special interest to erecting and operating refrigerating engineers, refrigeration machinery sales engineers, persons employed in building refrigerating machinery and those employed in ice making, cold storage plants or other establishments equipped with refrigerating machinery. Contains information that the refrigerating engineer should know in order that he may have complete and up-to-date knowledge.

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CRUSHER ICE UNIT SAVES TIME AND LABOR COST!

One man can do the work of two . . . loader acting as the second man. By first loading the hopper slide with six 50-lb. blocks of ice, operator will not have to bother loading the crusher and can devote his full time to bagging ice. Storage bin under crusher will hold approximately 100-lbs. of ice.

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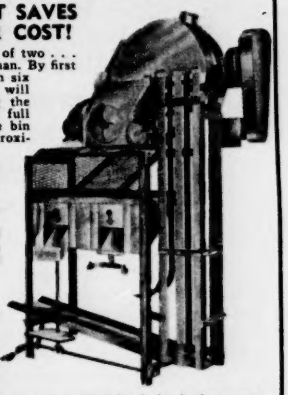
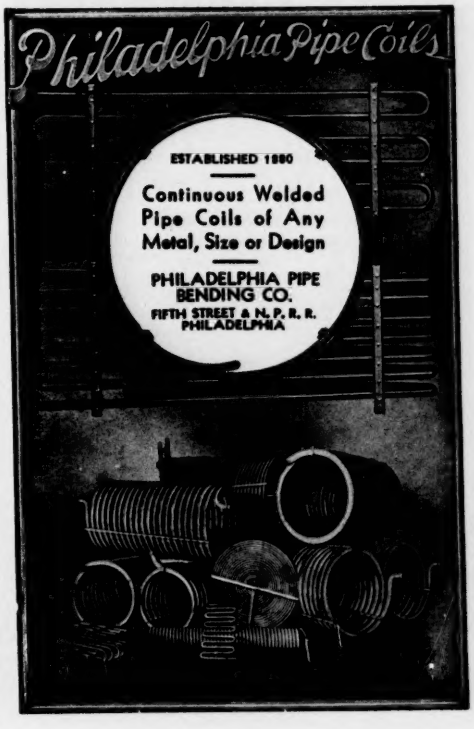
BAG HOLDER: A half ring holds the top of bag in place while bottom of bag sits on floor or platform.



FOOT-OPERATED DOOR FOR LOADER CRUSHER
Operator can fill paper bags at a very fast rate for each magazine of ice used. Operator holds bag with both hands, pushing down on foot lever will open the chute allowing the ice to flow into the bag. When the proper amount of crushed ice is in the bag, operator removes foot from pedal cutting the flow of ice off. The operator while he has the bag in this position can tie the bag while the bin is being filled for another bag. Elevator can be stopped at any time to allow the operator more time if needed.

LOADER CRUSHER $715.00
(¾ h.p. motor at prevailing price)
F.O.B. Mineral Wells, Texas.

Bateman Write For Details Mineral Wells, Texas
Ice Processing Equipment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Vivian Mfg. Co., St. Louis, Mo.

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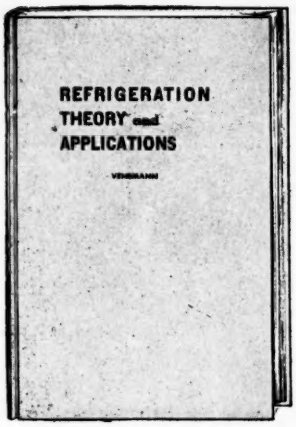

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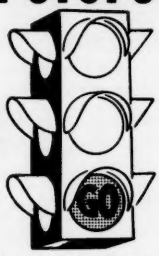

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DUQUESNE ELECTRIC & MFG. CO.
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Phone MOntrose 1-5800

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1—Hoffman blower, 1—Wilbrahn-Green Blower.
2—60 KVA condensers or capacitors.
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2—Can Euclid hoist—1 ton.
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1—Model JBAZ International water softener complete steel tank—top operated with mixer—one 24" and one 30" pressure filter.
1—Cook 8"—5 stage turbine pump, 5 h.p.
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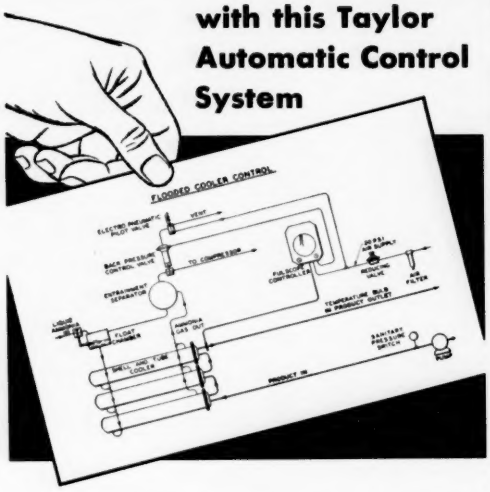
without freezeups

with this Taylor Automatic Control System



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Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Taylor Instruments
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ACCURACY FIRST
IN HOME AND INDUSTRY

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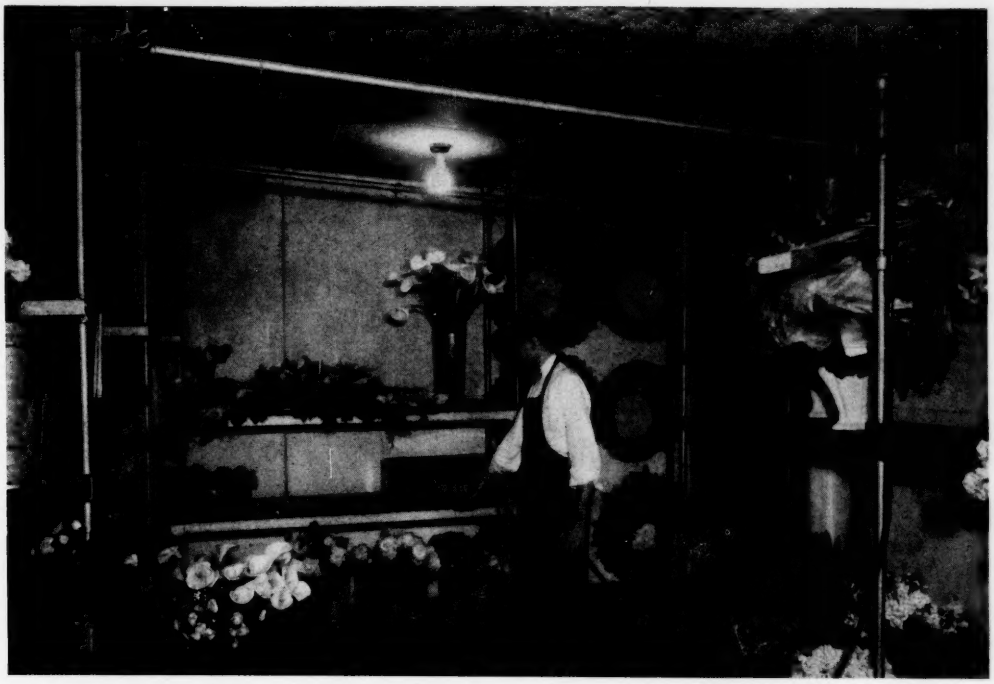


How old is the insulation in this cold room?

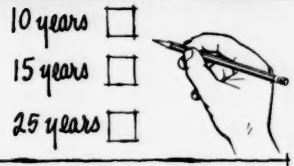
This florist's cooler room certainly doesn't look its age. Despite severe moisture conditions, the corkboard insulation is still completely dry although it was installed in 1929—23 years ago! It needs no repairs, shows no signs of deterioration, and the finish is practically as good as new.

The room itself is built of two layers of Armstrong's Corkboard, each 2" thick. The wall at the right is a free-standing corkboard partition of the same thickness. Surfaces are finished with portland cement plaster and scored according to standard specifications.

In continuous service for all these 23 years, the room is still highly efficient, holding temperatures of 48° F. at remarkably low refrigerating costs.

Unusual? Not at all. Our records show that hundreds of installations using Armstrong's Corkboard are still performing at peak efficiency after 20, 30, and even 40 years!

It takes top-quality insulating materials and expert application to give long, trouble-free service like this. That's why it pays to contact Armstrong whenever you're planning any low-temperature work. We can take over the entire job for you—from specifications to application by skilled workmen—to insure a dependable, economical job. For further information, contact your near-by Armstrong office or write Armstrong Cork Company, 4511 Concord St., Lancaster, Pa.



Complete Insulation Contract Service

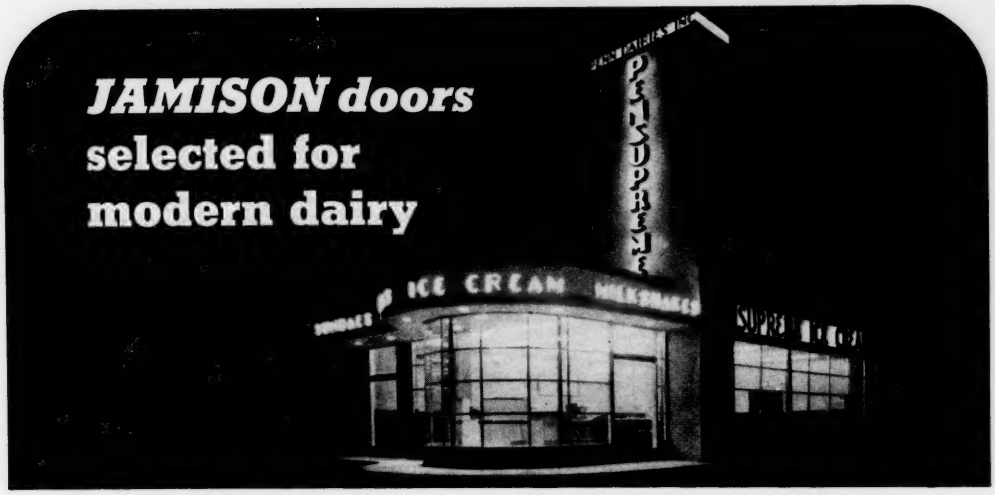
There are many factors that can't be written into an insulation contract, but which can largely determine whether or not the agreement will be entirely satisfactory. They include:

1. Financial responsibility—resources to complete the contract despite any unforeseen events.
2. Integrity—a reputation for quality work and for prompt settlement of any justified complaints.
3. Technical ability — experience, plus technical and research staff to do the job in accordance with best practices.
4. Manpower resources — trained supervisors and workmen able to handle any contract efficiently.
5. Efficiency — ability to deal with problems of accounting, tax provisions, insurance, and workmen's compensation.

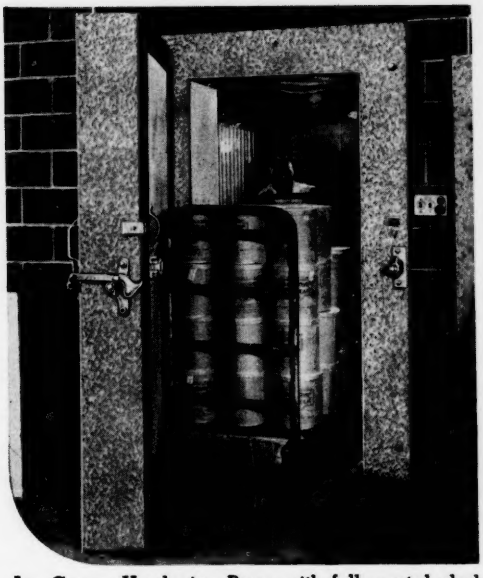
You get all these with an Armstrong Contract

ARMSTRONG'S INDUSTRIAL INSULATIONS

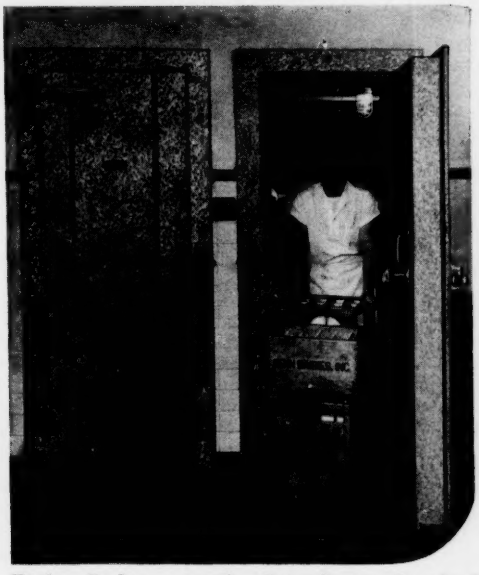
For temperatures from 300° below zero to 2800° F.



Drive-In Dairy Restaurant Ice Cream Distributing Depot of Penn Dairies, Inc., Reading, Penna.



Ice Cream Hardening Room with fully metal clad Jamison Super Freezer door.



Kitchen Cooler equipped with two Jamison Standard Doors for easy access. Fully metal clad.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

For specifications and dimensions request Catalog No. 1.
Jamison Cold Storage Door Company, Hagerstown, Maryland, U. S. A.